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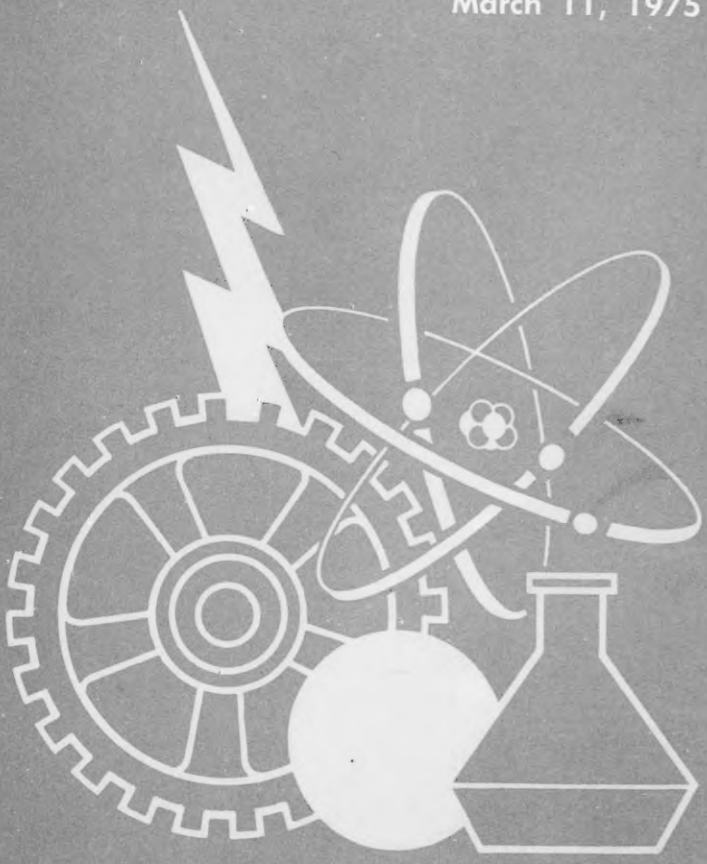
March 11, 1975



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UNITED STATES PATENT and TRADEMARK OFFICE

March 11, 1975 Volume 932 Number 2

CONTENTS

Page

Patent and Trademark Notices
- Board of Appeals Decisions Rendered in the Month of January 1975 . . . 340
- Express Mail . . . 340
- Title 37—Patents, Trademarks and Copyrights . . . 340
- Patent and Trademark Cases . . . 340
- Patent Suits . . . 347

Patent Notices
- Certificates of Correction for the Week of March 11, 1975 . . . 349
- Availability of Patents Official Gazette Jan. 28, 1975, Vol. 930/No. 4 . . 349
- Dedications . . . 349
- Disclaimers . . . 349

Condition of Patent Applications . . . 350

Reissue Patents Granted (28,361) . . . 351

Plant Patents Granted (3,688) . . . 352

Patents Granted
- General and Mechanical (3,869,726) . . . 353
- Chemical (3,870,464) . . . 591
- Electrical (3,870,814) . . . 682

Design Patents Granted (234,444) . . . 753

Index of Patentees . . . PI 1

Indices of Reissues, Plants and Designs . . . PI 39

Classification of
- Patents (Including Reissues) . . . PI 41
- Designs and Plants . . . PI 43

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . PI 44
- Designs and Plants . . . PI 45

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of January 1975

Examiner affirmed	162
Examiner affirmed in part	32
Examiner reversed	81
Total	275

Express Mail

The Patent and Trademark Office has made an arrangement with the U.S. Postal Service for the delivery of "Express Mail." This arrangement provides for the delivery of "Express Mail" to a Patent and Trademark Office employee in the Department of Commerce Building in Washington, D.C., thus guaranteeing delivery to us in the same manner as "Express Mail" is delivered to any other addressee in the city of Washington. "Express Mail" requires the recipient to indicate both the time and date of delivery. The date which our employee in the Department of Commerce Building receives the mail will be the Official Office Receipt Date.

The address which should be used for "Express Mail" is:

Commissioner of Patents and Trademarks
Washington, D.C. 20231.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Feb. 11, 1975.

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Listing of Certain Prior Applications

On June 26, 1974, notice of proposed rule making regarding an amendment of §§ 1.65 and 1.67 of Title 37, Code of Federal Regulations, dealing with the listing of certain prior applications in the application oath or declaration was published in the Federal Register (39 FR 24375). Interested persons were given until September 30, 1974, by Notice published in the Federal Register on August 7, 1974 (39 FR 28439), to submit written comments and suggestions. Full and careful consideration was given to all written comments received. The proposed rule language has been slightly revised.

In consideration of the comments received, and pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (85 Stat. 364; 35 U.S.C. 6), Part 1 of Title 37, Code of Federal Regulations, is hereby amended as follows:

1. In § 1.65, paragraph (a) is revised to read as follows:

§ 1.65 *Statement of applicant.*

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or by his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country. (2) This statement (i) must be subscribed to by the applicant, and (ii) must either (*a*) be sworn to (or affirmed) as provided in § 1.66, or (*b*) include the personal declaration of the applicant as prescribed in § 1.68. See § 1.153 for design cases and § 1.162 for plant cases.

* * * * *

2. In § 1.67, paragraph (a) is revised to read as follows:

§ 1.67 *Supplemental oath or declaration for matter not originally claimed.*

(a) When an applicant presents a claim for matter originally shown or described but not substantially embraced in the statement of invention or claim originally presented, he shall file a supplemental oath or declaration to the effect that the subject matter of the proposed amendment was part of his invention: that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof, or more than one year before his application, or in public use or on sale in the United States for more than one year before the date of his application, that said invention has not been patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application in this country on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in the United States, and has not been abandoned. Such supplemental oath or declaration should accompany and properly identify the proposed amendment, otherwise the proposed amendment may be refused consideration.

* * * * *

Effective date. These amendments shall become effective on May 1, 1975, and shall apply to applications filed after that date.

C. MARSHALL DANN,
Commissioner of Patents.

Approved:

DAVID B. CHANG,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 75-3736; Filed 2-10-75;8:45 am]

Published in 40 F.R. 6339, Feb. 11, 1975

Patent and Trademark Cases

[37 CFR Parts 1, 2, 4]

Rules and Procedures

Notice is hereby given that, pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440, 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952 (66 Stat. 793, 35 U.S.C. 6), as amended October 5, 1971 (85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.18, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2.120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187 and 4.2.

All persons are invited to present their written views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 1, 1975. No oral hearing will be held. Written comments or sug-

gestions will be available for examination by interested persons at Crystal Plaza Building 3, Room 11C17a, 2021 Jefferson Davis Highway, Arlington, Virginia.

Assignment records open to public inspection. The proposed revision of § 1.12 is intended to make clear the existing practice that assignment records relating to trademark applications and registrations are open to the public. The present wording, which is based on the amendment of § 1.12 on August 23, 1965 (819 O.G. 443), does not clearly distinguish between the procedure to be applied to patent records and to trademark records. In view of a number of inquiries as to the manner in which the amendment was to be applied, a notice was published in the OFFICIAL GAZETTE of January 18, 1966 (822 O.G. 769) stating that assignments relating to applications for registration of trademarks will be open to public inspection as heretofore. Since assignment records relating to trademark applications and registrations have always been open to the public, which practice continues at the present time, it is believed desirable to make the practice clear.

In the third sentence of the section, language is added to indicate that the requirement for written authority applies only to patent applications.

Time less than six months. It is proposed to revise paragraph (b) of section 1.136 to read "sufficient cause" rather than "good and sufficient cause." This revision is merely for consistency of language with other sections in this part and does not represent any change in practice.

Reconsideration of decision. It is proposed to revise paragraph (b) of § 1.197, paragraph (b) of section 1.256, paragraph (c) of §§ 2.129 and 2.144, to provide that the Board of Appeals, the Board of Patent Interferences, and the Trademark Trial and Appeal Board may, for sufficient cause, extend the time for filing a request for rehearing or reconsideration, or modification of a decision rendered by these Boards. Proposed revised paragraph (b) of § 1.256 and paragraph (c) of § 2.129 provide similar opportunity for extension of time for filing a reply to such a request in inter partes cases. The purpose of these revisions is to eliminate the necessity for waiver of a rule by the Commissioner in order for a party to obtain an extension of time.

In these sections, as well as in the related §§ 1.244(c), 2.127(b), 1.304 and 2.145(d), it is proposed to use the term "request" rather than "petition" in connection with rehearing or reconsideration, in order to avoid redundancy and in order to clearly distinguish such action from a petition to the Commissioner.

Time for appeal or civil action. Proposed revised § 1.304 and proposed revised paragraph (d) of § 2.145 clarify the portion of each which relates to the time for filing appeal or commencing civil action in cases where a request for rehearing or reconsideration, or modification of a decision, is filed. Present §§ 1.304 and 2.145(d) provide for an extension of time for appeal or civil action if a request for rehearing is filed within thirty days after a decision, but their language is subject to the interpretation that they deny any extension if the request for rehearing is filed more than thirty days after the date of a decision. It has been the practice of the Patent and Trademark Office, however, in those cases where the thirty days to file a request for rehearing has been enlarged by waiver of rule by the Commissioner under § 1.183 or § 2.148, to consider the waiver as also applying to the thirty day period specified in §§ 1.304 and 2.145(d). *Dresser Industries, Inc.* v. *Safety-Kleen Corporation*, 183 USPQ 180 (Comr. Pats. 1974).

In order to clarify the meaning of § 1.304 and paragraph (d) of § 2.145, it is proposed to revise these sections to eliminate all reference to a definite time for filing a request for rehearing, and to include instead reference to the provisions for filing request for rehearing which are made in §§ 1.197(b), 1.256(b), 2.129(c) and 2.144. Such sections are proposed to be revised to provide for extension of the basic time specified therein.

Proposed revised § 1.304 and paragraph (d) of § 2.145 also provide that the time for appeal or commencing civil action (whether it be the original sixty days, or the thirty days extension after decision on a request for rehearing) may be extended by the Commissioner upon a showing of sufficient cause.

Proposed revised § 1.304 is arranged in three subsections identified as (a), (b) and (c), and paragraph (d) of § 2.145 is arranged in three subsections identified as (1), (2) and (3). The purpose of separate subsections is to provide a means for easier reading and understanding of these sections in view of the fact that three different points are included in the sections. The proposed rearrangement does not affect practice.

Elimination of reasons of appeal in trademark cases. It is proposed to revise paragraphs, (a), (b) and (d) of § 2.145 to eliminate reference to the need to file the reasons of appeal in the Patent and Trademark Office when appealing a decision of the Trademark Trial and Appeal Board to the U.S. Court of Customs and Patent Appeals, consistent with the modification of section 21 of the trademark act made by Pub. L. 93–600, enacted January 2, 1975.

Recognition for representation, powers of attorney, and correspondence with attorney. It is proposed to revise §§ 2.18 and 4.2 to clarify the existing practice of the Patent and Trademark Office in relation to firms of attorneys and powers of attorney, and the handling of correspondence with attorneys and other recognized persons, in trademark cases.

Under present practice firms of attorneys are not recognized for practice before the Office in trademark cases. The persons identified in § 2.12 who may represent others before the Office are persons to whom individual responsibility may attach for actions taken and who must conform under § 2.13 to the Code of Professional Responsibility of the American Bar Association. Section 2.12(a) pertains to attorneys at law and does not provide for representation by a firm of attorneys as distinguished from individual attorneys. Further, reference to representation by a firm of attorneys was eliminated from § 2.15 by amendment effective July 2, 1971 (see 890 O.G. TM 60, September 14, 1971). If a firm name is given in the signature location on a paper filed by an attorney, nevertheless under § 2.15 an individual attorney must actually sign the paper.

It is not necessary under existing practice for an attorney at law filing a paper in connection with a trademark case to have a power of attorney from the party whom he represents. Normally, a letter of transmittal on an attorney's letterhead for a paper not required to be signed by the attorney, such as an application, or an attorney's signature on a paper during prosecution, or a personal appearance, is sufficient for an attorney to be recognized as a party's representative. If deemed necessary, further proof may be required under § 2.17 (a) of an attorney's authority to act for a party or an attorney's qualifications under § 2.12(a).

Although not needed, a written power of attorney is accepted if it is filed. Such power may be revoked, and if revoked, the Office will not thereafter recognize such attorney in that case unless he is again specifically appointed. Any written power of attorney which is filed should designate individuals and not firms of attorneys; a power of attorney which designates a firm rather than individuals is not considered to be a power but merely a direction that correspondence be addressed to that firm. (See 890 O.G. TM 60, September 14, 1971.)

It is proposed to eliminate from § 4.2 (power of attorney form) the requirement to identify bar membership, since further proof may be required under section 2.17(a) if there appears to be any reason to question either an attorney's authority to represent a party or an attorney's qualifications under § 2.12(a). It is further proposed to eliminate from § 4.2 present Note (8) which calls for the names of law firm members and their bar membership if a firm name is used, and to add a new Note (8) which indicates that individuals should be appointed and that naming a firm will serve only as a designation of address for correspondence.

Proposed revised § 2.18 is intended to clarify the practice relative to the address to which correspondence is sent by the Office when an attorney at law or other recognized person is acting on behalf of a party. When an attorney or other recognized person is representing a party, correspondence is sent to such attorney or other recognized person at the address specified when such person's representation is established. The Office will not undertake to correspond with more than one person at more than one address. Therefore if another attorney or recognized person files a paper, the paper will be accepted but correspondence will continue to be sent to the address of the attorney or representative as already established in the file until the Office receives written instruction by the attorney or other representative, or by the party being represented, to send correspondence to another address. A subsequently filed power of attorney or authorization of agent is regarded by the Office as a change of address for correspondence even though there is no revocation of the previous power or authorization, but in other situations a specific request is necessary, and language such as "Send correspond-

ence to (giving address, or name and address)", is the most desirable means for changing the correspondence address. Other types of statements will be accepted by the Office if their intention is sufficiently clear to be reasonably interpreted as a request to change the address to which correspondence is to be sent. Neither the appointment of an associate attorney nor the filing of a paper by a different recognized representative has any effect on correspondence unless an instruction to change the correspondence address is included.

The Office does not send notice or acknowledgment of changes of address. Only a written revocation of a written power of attorney is acknowledged by the Office.

Designation of domestic representative by person not domiciled in the United States. In § 2.37 and paragraph (a)(4) of § 2.185, it is proposed to change the terms "appointment" and "resident agent" to "designation" and "domestic representative," respectively, to conform to the language of section 1(d) of the Trademark Act of 1946. This will not change present practice.

Effective filing date for the Supplemental Register. In § 2.75 it is proposed to add the word "effective" before "filing date" in order to make clear the existing practice that, when the filing date of an amendment to convert an application for registration on the Principal Register to an application for registration on the Supplemental Register becomes the filing date of the latter application, such date is considered to be the effective filing date of that application. This change in wording is in agreement with the language "effective filing date" used in § 2.83.

Publication of marks placed in interference. The proposed revision of § 2.80 restores a reference to publication of the mark in case of interference which was omitted inadvertently when § 2.80 was amended as of March 1, 1972 (896 O.G. TM 2). Although interference is not now declared except upon petition to the Commissioner (amendment of § 2.91 as of March 1, 1974 (896 O.G. TM 2)), the practice of publishing the mark when interference is declared was continued.

Fee for petition to revive a multiple class application. It is proposed to revise paragraph (e) of § 2.85 to delete reference to a petition to revive and thereby to make clear that only one fee is required for a petition to revive an abandoned application in which there is more than one class. Section 31 of the trademark act specifies a fee which shall be paid "on filing each petition for the revival of an abandoned application" without qualification as to the number of classes in the application, and therefore only one fee for each petition is considered to be necessary. For the same reason, in connection with multiple class registrations, under existing practice a single fee is sufficient for issuance of a new certificate of registration following change of ownership of a mark (§ 2.171) or correction of a registrant's mistake (§ 2.175), for certificate of correction of registrant's mistake (§ 2.175), or for amendment or disclaimer after registration (§ 2.173).

Fee required for each class being opposed, and insufficient fees for classes in application being opposed. Proposed revised §§ 2.101, 2.102 and 2.103 make clear the existing requirement that when there is more than one class in an application (such as in a combined application), the required fee must be paid for each class when filing an opposition against such application.

These proposed revised sections also provide that when the fees which accompany an opposition are insufficient to cover all classes in the application being opposed, which may occur with a combined application, opposer should specify the classes in which opposition to registration of the mark is sought, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to process the opposition promptly in the particular classes which opposer desires. This is in accord with present practice. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Joining persons in an opposition. Proposed revised § 2.101 provides that two or more persons may be joined in an opposition, but that the required fee for each class in which each person seeks opposition must be paid for each person so joined. By this revision, existing practice is incorporated into this section. See notice in the OFFICIAL GAZETTE of August 11, 1964 (805 O.G. TM 39).

Unverified opposition during extension of time. It is proposed to further revise §§ 2.102 and 2.103 to permit an unverified opposition to be filed by an attorney or agent during an extension of time for opposition as well as within the original thirty days for opposition after publication of the mark. Present practice limits the filing of an unverified opposition to thirty days after publication. Nevertheless it has been found that some oppositions filed during extensions of time are unverified, and that when the defect is discovered, either there is insufficient time in the extended period to file a verified opposition or the period has expired. It seems desirable to eliminate a situation that has in some cases proven to be a difficulty for opposers. Since the main effort and cost of preparing and filing an opposition is expended even though the opposition is unverified, it is believed that in most instances opposers will file verified oppositions in extended opposition periods. Further, any unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing. For both reasons it is believed that the proposed change in practice will not result in any undue delay in registration.

Proposed revised § 2.102 provides that an opposition filed within an extension of time to oppose must be accompanied by the required fee for each class, and states that the opposition should be verified or include a declaration in accordance with § 2.20. However, in case verification or declaration cannot be secured within the extension of time, proposed revised § 2.103 provides that an unverified opposition may be filed within an extension of time to oppose. Such unverified opposition must be confirmed by opposer by verification or declaration within thirty days after its filing.

Extension of time to oppose. It is proposed to further revise § 2.102 to make clear existing practice as to who may request an extension of time to oppose and who may file opposition during an extension of time. Request to extend the time for filing opposition must be made by a person who is eligible to oppose, that is, a person who believes that he would be damaged by the registration of the mark on the Principal Register. An attorney at law or other person recognized to represent a party may file a request for extension of time on behalf of a potential opposer. *La Maur, Inc.* v. *Andis Clipper Co.*, 181 USPQ 783 (Comr. Pats. 1974). The potential opposer must be identified in the request for extension because an extension of time is a personal privilege which is normally granted only to the person who has requested it. A problem has been, however, that complete information is sometimes not available at the time request for extension of time must be filed, so that there is a misidentification of the potential opposer, or, where there are parties in privity, for example related companies, one of the interested parties is named whereas later the other will be found to be the proper party to oppose. For this reason, it is considered desirable to permit opposition to be filed during an extension of time by a person whose name varies or is different from the name of the person to whom the extension was granted, provided the difference in names constitutes mere misidentification as a result of mistake and is not a difference in entity, or provided the persons designated are in privity, such as in the case of related companies under section 5 of the trademark act. This practice is in accord with the decision in *F. Jacobson & Sons, Inc.* v. *Excelled Sheepskin Co.*, 140 USPQ 281 (Comr. Pats. 1963). An analogous situation is found in *Universal Oil Products Co.* v. *Rexall Drug and Chemical Co.*, 174 USPQ 458 (CCPA 1972), where a parent company was permitted to oppose although the mark on which opposition was based was owned by the parent's subsidiary company.

When there is uncertainty between persons in privity as to which will ultimately be the proper opposer, it is desirable that the persons and their relationships be identified as clearly as possible in the request for extension of time.

First thirty-day extension of time to oppose. It is proposed to revise § 2.102 consistently with Pub. L. 93–600, effective January 2, 1975, which provides for a first thirty-day extension of the time for filing an opposition upon request without showing good cause.

Transmittal of opposition. It is proposed to revise § 2.105 to eliminate reference to transmittal of an opposition by the Examiner of Trademarks to the Trademark Trial and Appeal Board, in view of the fact that all activity connected with the processing of oppositions has been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board.

It is further proposed to revise § 2.105 by changing the word "notice" throughout the section to the word "notification" and also by changing the word "Institution" in the heading of the section to the word "Notification". The purpose of these changes is to make clear the present practice of

regarding the paper which is prepared in accordance with this section to be merely a notification to the parties of the existence of a proceeding which commenced at the time the opposition was filed.

Fee required for each class for cancellation, and insufficient fees for classes in registration. Proposed revised §§ 2.111 and 2.112 make clear the existing requirement that when there is more than one class in a registration, the required fee must be paid for each class when filing a petition to cancel the registration. A petition to cancel which is accompanied by fees insufficient to cover each class in the registration should specify the classes for which cancellation is sought, so that the Office will not be required to select classes or make further inquiry in that respect, and cancellation may be accomplished promptly in the classes desired. This is in accord with present practice.

Order compelling discovery in inter partes cases. Because of the increasing burden upon the Trademark Trial and Appeal Board as a result of the frequency and complexity of the motions being filed to compel discovery under rules adopted July 1, 1972 (898 O.G. TM 170, May 16, 1972), it is considered desirable that before seeking an order from the Board compelling discovery, the parties themselves be required to attempt to resolve the issues by mutual agreement. It is proposed to accomplish this by revising paragraph (c) of § 2.120 to require that a motion for an order compelling discovery be supported by an affidavit or a declaration in accordance with § 2.20 stating that the moving party or its attorney has conferred with the opposing party or its attorney in good faith in an effort to resolve by agreement the issues raised by the motion and that the parties have been unable to reach agreement with respect thereto, or specifying the parts of the issues, if any, which have been resolved. See *Angelica Corporation* v. *Collins & Aikman Corporation,* 183 USPQ 378 (TT&A Bd. 1974), and *Cool-Ray, Inc.* v. *Eye Care, Inc.,* 183 USPQ 618 (TT&A Bd. 1974).

Requirements for depositions. It is proposed to revise paragraph (g) of § 2.123 by adding a subsection numbered (3) thereto in order to restore to this section a designation of the existing requirements as to the form of depositions which was omitted inadvertently when paragraph (g) of this section was amended as of July 1, 1972 (898 O.G. TM 170, May 16, 1972).

Comments on inter partes procedures in general. In addition to the changes in inter partes procedures which are proposed herein, the Patent and Trademark Office is currently making an overall review of the efficiency and effectiveness of all of the amended inter partes rules of procedure in trademark cases which became effective as of July 1, 1972 (898 O.G. TM 170, May 16, 1972). The Patent and Trademark Office would welcome comments on any present inter partes procedures separate from comments on the specific revisions proposed herein.

Requests for reconsideration of decisions on motions. Motion procedures before the Trademark Trial and Appeal Board under §§ 2.127 and 2.129 follow the Federal Rules of Civil Procedure, which results in a multiplicity of types of motions being available. Some of these could be finally dispositive of a case and appeal could be taken from them. It therefore seems desirable to distinguish in trademark cases between the procedures as to decisions on motions which are finally dispositive of a case and decisions on motions which are not finally dispositive. To accomplish this it is proposed to revise paragraph (b) of § 2.217 to limit the section to motions which are not finally dispositive of a case. Any request for rehearing of such motions must be filed within thirty days, as is the existing practice. It is proposed to revise paragraph (c) of § 2.219 to include a reference to decisions on motions which are finally dispositive of a case and thus to make it clear that a request for rehearing of any final decision (including those on motions) may be filed within thirty days and that such time may be extended for sufficient cause.

Fee required for each class on appeal, and insufficient fees for classes in application on appeal. Proposed revised § 2.141 makes clear the existing requirement that when there is more than one class in an application (such as in a combined application), the prescribed fee must be paid for each class when appealing to the Trademark Trial and Appeal Board.

The proposed revised section also provides that when the fees which accompany an appeal are insufficient to cover all classes in the application being appealed, which may occur with a combined application, applicant should specify the classes in which appeal is taken, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to set up the appeal promptly in the particular classes which applicant desires. This is in accord with present practice.

Requirements for affidavit or declaration under section 8 of the Act of 1946. Proposed revised § 2.162 provides that an affidavit or declaration in accordance with § 2.20 containing either a statement of use or recitation of facts as to excusable nonuse must be filed before the expiration of the specified sixth year. However, if the evidence supporting the statement of use is not submitted or is found to be deficient, such supporting evidence may be filed thereafter, and may be considered even though filed after the expiration of the sixth year, and if the recitation of facts as to nonuse are found not to be sufficient, further evidence or explanation may be submitted and may be considered even though filed after the expiration of the sixth year. The statement of use or the recitation of facts as to excusable nonuse in the affidavit or declaration meets the statutory requirement of making a showing within the sixth year, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company,* 177 USPQ 274 (Comr. Pats. 1973).

The phrase "specifying the nature of such use" is omitted from paragraph (c) of proposed revised § 2.162 because its meaning is unclear and it does not identify any requirement which is necessary for an affidavit or declaration under section 8 of the act.

The proposed revised section also makes it clear that where there is more than one class in a registration, a statement of use or a statement as to nonuse, and appropriate evidence in support thereof, is necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration. An affidavit or declaration under section 8 which is accompanied by fees insufficient to cover each class in the registration should specify the classes to which the affidavit or declaration pertains, so that the Office will not be required to select classes or make further inquiry in that respect and will be able to determine promptly the question of acceptance or refusal in relation to relevant classes.

Surrender for cancellation. Proposed revised § 2.172 makes clear the existing practice of regarding a request to delete one entire class, or more than one entire class but less than the total number of classes, from a registration in which there is more than one class, as a surrender of a registration as to the specified class or classes, and not as an amendment of a registration. Each class is treated in effect as a separate registration. On the other hand, deletion of less than all of the goods or services in a class constitutes amendment of a registration as to that class. No fee is required for surrender, whereas a fee is required for each class which is amended.

Requirements of application for renewal. It is proposed to revise paragraph (c) of § 2.183 to provide that when facts are recited in an application for renewal to show excusable nonuse and such facts are found to be deficient, additional evidence or explanation may be considered by the Examiner even though filed after the expiration of the initial six month period for applying has expired, or after the three month delay period in the case of a delayed application for renewal. The recitation in the application of facts to show excusable nonuse meets the statutory requirement of making a showing within the required time, although such statement or recitation is not necessarily conclusive and may be required to be supported by other evidence. *In re The Magnavox Company,* 177 USPQ 274 (Comr. Pats. 1973).

Section 2.183 as proposed to be revised also makes clear the existing practice that when there is more than one class in a registration, a declaration or verified statement of use and a specimen or facsimile, or a recitation of facts as to nonuse, are necessary with respect to each class in the registration, and that the required fee is necessary for each class in the registration when renewing the registration. An application for renewal which is accompanied by fees insufficient to cover each class should specify the classes with regard to which renewal is desired.

Signature of translator for English translation. The proposed revision of paragraph (a)(2) of § 2.185 is intended to make it clear that the signature necessary for an English translation of a foreign document is the signature of the translator of the document, and that the signature only is needed, not a verification or a declaration in accordance with section 2.20.

Certificate of registration may issue to assignee. Proposed revised § 2.187 sets forth more specifically the procedure for giving notice to the Patent and Trademark Office in time to permit issuance of a certificate of registration in a name other than the name of the original applicant. If an assignment document or a certificate of change of name is of record in the Assignment Division of the Patent and Trademark Office before the notice of publication of a mark is mailed, there is sufficient time for the necessary information to reach the application file before the application is prepared for issuance of the certificate of registration. Also, if at any time prior to the preparation of the application for issue, a paper is filed in an application stating that a document has been filed for recordation, the application can be flagged and held until the necessary information reaches the file from the Assignment Division.

If a certificate of registration is to be issued to an assignee, there must be in the application file an address for such assignee; if there is not, the inquiry necessary to obtain the address may delay the issuance of the certificate of registration.

Change in name of Patent Office. All of the sections proposed to be modified herein have been revised to reflect the change in the name of the Patent Office to the Patent and Trademark Office, and the change in title of the Commissioner of Patents to Commissioner of Patents and Trademarks, in accordance with Pub. L. 93–596, effective January 2, 1975.

The text of the proposed revised sections or paragraphs of sections is as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned patent application are not available to the public. Copies of any such patent assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such patent application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

§ 1.136 *Time less than six months.*

* * * * *

(b) The time for reply, when a time less than six months has been set, will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. Only one extension may be granted by the primary examiner in his discretion; any further extension must be approved by the Commissioner. In no case can any extension carry the date on which response to an action is due beyond six months from the date of the action.

§ 1.197 *Action following decision.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. Such time may be extended upon a showing of sufficient cause.

* * * * *

§ 1.244 *Motions; miscellaneous provisions.*

* * * * *

(c) Any request for rehearing or reconsideration, or modification of the decision, must be filed within twenty days after the date of the decision, and any reply thereto shall be filed within twenty days from the date of service of the request.

* * * * *

§ 1.256 *Final hearing.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto shall be filed within fifteen days from the filing of the request. The times specified herein may be extended upon a showing of sufficient cause. (See § 1.304.)

§ 1.304 *Time for appeal or civil action.*

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Customs and Patent Appeals (§ 1.302) or for commencing a civil action (§ 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time, or within any extension of the time granted under §§ 1.256(b) or 1.197(b), the time for filing appeal or commencing civil action is extended to thirty days after action on the request. The sixty and thirty day periods referred to above may be extended by the Commissioner upon a showing of sufficient cause.

(b) The times specified herein are calendar days. If the last day of the time specified for appeal or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under 35 U.S.C. 141 that he elects to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141.

§ 2.18 *Correspondence held with attorney or agent.*

Correspondence will be sent to the applicant or a party to a proceeding at his address unless papers are transmitted by an attorney at law, or a written power of attorney or authorization of agent is filed, or the applicant or party designates in writing another address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmitting the papers, or to the attorney designated in the power of attorney or the agent designated in the authorization of agent, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney or other recognized person representing the applicant or party, indicates in writing that correspondence is to be sent to another address. Double correspondence will not be undertaken by the Patent and Trademark Office, and if more than one attorney at law or other recognized person appears or signs a paper, the Office reply thereto will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other recognized person representing the applicant or party.

§ 2.37 *Authorization for representation; U.S. representative.*

The authorization of a qualified person to represent applicant (§ 2.17(b)) and the designation of a domestic representative (§ 2.24) may be included as a paragraph or paragraphs in the application.

§ 2.75 *Amendment to change application to different register.*

An application for registration on the Principal Register may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the requirements for registration on the appropriate register, as the case may be. The original filing date may be considered for the purpose of proceedings in the Patent and Trademark Office provided the application as originally filed was sufficient for registration on the register to which amended. Otherwise, the filing date of the amendment will be considered the effective filing date of the application so amended.

§ 2.80 *Publication for opposition.*

If, on examination or reexamination of an application for registration on the Principal Register, it appears that the applicant is entitled to have his mark registered, the mark will be published in the OFFICIAL GAZETTE for opposition. The mark will also be published in the case of an application to be placed in interference or concurrent use proceedings, if otherwise registrable.

§ 2.85 *Classification schedules.*

* * * * *

(e) Where the amount of the fee received on filing an appeal in connection with an application or on filing an affidavit under section 8(a) or 8(b) or on an application for renewal or in connection with an opposition or petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because a multiple class application or registration is involved, the appeal or the affidavit or renewal application or opposition or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Examiner.

* * * * *

§ 2.101 *Time for filing opposition.*

Any person who believes that he would be damaged by the registration of a mark upon the Principal Register may, upon payment of the required fee for each class in the application, oppose the same by filing an opposition, which is verified or which includes a declaration in accordance with § 2.20, in the Patent and Trademark Office within thirty days after publication (§ 2.80) of the mark sought to be registered. An opposition accompanied by fees insufficient to cover each class in the application should specify the particular classes in which opposition is sought. Two or more persons may be joined in an opposition to the registration of a mark, but separate fees for each class in the application for each person so joined must be paid.

§ 2.102 *Extension of time.*

(a) A request to extend the time for filing opposition must be made by a person who believes that he would be damaged by the registration of the mark on the Principal Register, but an attorney at law or other person recognized to represent a party may file the request on behalf of a potential opposer. The potential opposer must be identified with reasonable certainty in the request. Any opposition filed during an extension of time should be in the name of the person to whom the extension was granted, but an opposition may be accepted if the person to whom the extension was granted was misidentified through mistake, or an opposition filed in a different name may be accepted if the person filing the opposition is in privity with the person to whom the extension was granted.

(b) A request to extend the time for filing an opposition must be received in the Patent and Trademark Office before the expiration of thirty days from the date of publication, and should specify the period of extension desired. A first extension of time will be granted upon request if the extension is for not more than thirty days. Any other request for extension of time for filing an opposition should be accompanied by a showing of good cause, and in the event circumstances do not permit submission of such showing with the request, it should be furnished as promptly as possible and, in any event, within ten days after submission of such request.

(c) An opposition filed within an extended time must be accompanied by the required fee for each class, and should be verified or include a declaration in accordance with § 2.20, and if it is accompanied by fees insufficient to cover each class in the application should specify the particular classes in which opposition is sought.

§ 2.103 *Opposition filed by attorney or agent.*

An opposition which is unverified or not accompanied by a declaration in accordance with § 2.20 may, upon payment of the required fee for each class, be filed by a duly authorized attorney or agent. Such opposition and the required fee for each class must be filed in the Patent and Trademark Office within thirty days after publication (§ 2.80) of the mark sought to be registered or within an extension of the time for filing an opposition (§ 2.102) but the opposition will be null and void unless confirmed by the opposer either by verification or declaration in proper form filed within thirty days after such filing, or within such further time as may be fixed by the Commissioner upon request made before the expiration of the thirty days. An opposition accompanied by fees insufficient to cover each class should specify the particular classes in which opposition is sought.

§ 2.105 *Notification of opposition proceedings.*

A notification of an opposition which has been regularly filed shall be prepared, identifying the title and number of the proceeding and the application involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. Copies of this notification shall be forwarded by the Trademark Trial and Appeal Board to the parties in care of their attorneys or agents, if they have attorneys or agents of record. The duplicate copy of the opposition and exhibits shall be forwarded with the notification to the applicant.

§ 2.111 *Time for filing petition for cancellation.*

(a) Any person who believes that he is or will be damaged by a registration may, upon payment of the required fee for each class in the registration, apply to the Commissioner to cancel said registration. Such petition may be made at any time in the case of registrations on the Supplemental Register or under the Act of 1920, or registrations under the act of 1881 or the act of 1905 which have not been published under section 12(c) of the act (§ 2.153), and in cases involving the grounds specified in section 14 (c), (d), and (e) of the act. In all other cases such petition must be made within five years from the date of registration of the mark under the act of 1946 or from the date of publication under section 12(c) of the act.

(b) A petition to cancel accompanied by insufficient fees to cover each class in the registration should specify the particular classes for which cancellation is sought.

§ 2.112 *Petition for cancellation.*

The petition to cancel, which must be verified, or include a declaration in accordance with § 2.20, must set forth a short and plain statement showing how the petitioner is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notice shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition. Applications to cancel different registrations owned by the same party may be joined in one petition when appropriate, but the required fee for each class in each registration against which each application to cancel is filed must accompany the petition. A petition to cancel accompanied by insufficient fees to cover all classes should specify the particular classes for which cancellation is sought.

§ 2.120 *Discovery procedure.*

* * * * *

(c) *Failure to make discovery: Sanctions.* (1) If any party fails or refuses to answer any proper question in taking discovery depositions or fails or refuses to answer any proper question propounded by interrogatories or fails or refuses to comply with a request to produce and permit the inspection and copying of designated things, the party seeking discovery may file a motion with the Trademark Trial and Appeal Board for an order compelling discovery. Such a motion must be supported by an affidavit or a declaration in accordance with § 2.20, stating that the moving party or its attorney has conferred with the opposing party or its attorney in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If part of the issues raised by the motion have been resolved by agreement, the affidavit or declaration shall specify the issues so resolved and also specify the issues remaining unresolved.

(2) If a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to obey an order to provide or permit discovery, the Trademark Trial and Appeal Board may strike out all or any part of any pleading of that party, dismiss the action or proceeding, or deny any part thereof, enter judgment as by default against that party or take any such other action as may be deemed appropriate.

§ 2.123 *Trial testimony in inter partes cases.*

* * * * *

(g) Form of deposition:

* * * * *

(3) Each deposition must contain an index of the names of the witnesses, giving the pages where their examination and cross-examination begin, and an index of the exhibits, briefly describing their nature and giving the pages at which they are introduced and offered in evidence.

* * * * *

§ 2.127 *Motions.*

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(b) Any request for rehearing or reconsideration, or modification of a decision on a motion which is not finally dispositive of the case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed with fifteen days after service of the request.

* * * * *

§ 2.129 *Oral argument, and reconsideration.*

* * * * *

(c) Any request for rehearing or reconsideration, or modification of a decision, including a decision on a motion which is finally dispositive of a case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request. The times specified herein may be extended upon a showing of sufficient cause.

§ 2.141 *Ex parte appeals from the Examiner of Trademarks.*

Every applicant for the registration of a mark may, upon final refusal by the Examiner of Trademarks, appeal to the Trademark Trial and Appeal Board upon payment of the prescribed fee for each class in the application. An appeal accompanied by insufficient fees to cover each class in the application should specify the particular classes in which appeal is taken. A second refusal on the same grounds may be considered as final by the applicant for purpose of appeal.

§ 2.144 *Reconsideration of decision on ex parte appeal.*

Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the decision. Such time may be extended upon a showing of sufficient cause.

§ 2.145 *Appeal to court and civil action.*

(a) *Appeal to U.S. Court of Customs and Patent Appeals.* An applicant for registration, or any party to an interference, opposition or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Customs and Patent Appeals. The appellant must take the following steps in such an appeal: (1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section); (2) In the court, file a petition of appeal and a certified transcript of the record within a specified time after filing the notice of appeal, and pay the fee for appeal, as provided by the rules of the court. The transcript will be transmitted to the Court by the Patent and Trademark Office on order of and at the expense of the appellant. Such order should be filed with the notice of appeal, but in no case should it be filed later than 15 days thereafter.

(b) *Notice of appeal.* (1) When an appeal is taken to the U.S. Court of Customs and Patent Appeals, the appellant shall give notice thereof in writing to the Commissioner, which notice shall be filed in the Patent and Trademark Office within the time specified in paragraph (d) of this section. The notice shall specify the party or parties taking the appeal and shall designate the decision or part thereof appealed from.

(2) In inter partes proceedings, the notice must be served as provided in § 2,119.

* * * * *

(d) *Time for appeal or civil action.* (1) The time for filing the notice of appeal to the U.S. Court of Customs and Patent Appeals (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time, or within any extension of the time granted under § 2.129(c) or § 2.144, the time for filing appeal or commencing civil action is extended to thirty days after action on the request. The sixty- and thirty-day periods referred to above may be extended by the Commissioner upon a showing of sufficient cause.

(2) The times specified herein are calendar days. If the last day of time specified for appeal, or commencing a civil action falls on a Saturday, Sunday, or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under section 21(a)(1) of the act that he elects to have all further proceedings conducted under section 21(b) of the act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the act.

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

The affidavit or declaration required by § 2.161 must:

(a) Be executed by the registrant after expiration of the five-year period following the date of registration or of publication under section 12(c) of the act;

(b) Be filed in the Patent and Trademark Office before the expiration of the sixth year following the date of registration or of publication under section 12(c) of the act;

(c) Identify the certificate of registration by the registration number and date of registration;

(d) Be accompanied by the required fee for each class in the registration. If accompanied by insufficient fees to cover each class, the particular classes to which the affidavit or declaration pertains should be specified;

(e) State that the registered mark is in use. The statement must be supported by evidence which shows that the mark is still in use, and normally such evidence consists of a specimen, a facsimile specimen, or a statement of facts concerning use. The supporting evidence should be submitted with the affidavit or declaration, but if it is not or if the evidence submitted is found to be deficient, the evidence, or further evidence, may be submitted and may be considered even though filed after the sixth year has expired;

(f) If the registered mark is not still in use, recite facts to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. If the facts recited are found not to be sufficient, further evidence or explanation may be submitted and may be considered even though filed after the sixth year has expired; and

(g) Contain the statement of use or statement as to nonuse and appropriate evidence in support thereof, as required in paragraphs (e) and (f) of this section, for each class in the registration.

§ 2.172 *Surrender for cancellation.*

Upon application by the registrant, the Commissioner may permit any registration to be surrendered for cancellation. Application for such action must be signed by the registrant and must be accompanied by the original certificate of registration, if not lost or destroyed. When there is more than one class in a registration, a request to delete one entire class or more than one entire class but less than the total number of classes constitutes surrender of a registration or registrations as to the specified class or classes, and not amendment of a registration. Deletion of less than all of the goods or services in a single class constitutes amendment of registration as to that class.

§ 2.183 *Requirements of application for renewal.*

(a) The application for renewal must include a statement which is verified or which includes a declaration in accordance with § 2.20 by the registrant setting forth the goods or services recited in each class in the registration on or in connection with which the mark is still in use in commerce, specifying the nature of such commerce. This statement must be executed not more than six months before the expiration of the registration and be accompanied by:

(1) A specimen or facsimile for each class showing current use of the mark;

(2) The required fee for each class including an additional fee for each class in the case of a delayed application

for renewal. If the application for renewal is accompanied by insufficient fees to cover each class, particular classes for which renewal is sought should be specified.

(b) The declaration or verified statement, specimen or facsimile and the fee for each class in the registration must be filed within the period prescribed for applying for renewal. If defective or insufficient, they cannot be completed after the period for applying for renewal has passed; if completed after the initial six month period has expired but before the expiration of the three month delay period, the application can be considered only as a delayed application for renewal.

(c) If the mark is not in use in commerce at the time of filing of the declaration or verified statement, facts must be recited to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. There must be a recitation of facts as to nonuse for each class or it must be clear that the facts recited apply to each class. If the facts recited require amplification or explanation, further evidence may be submitted and may be considered even though filed after the period for applying for renewal has passed.

§ 2.185 *Requirements for assignments.*

(a) Assignments under section 10 of the act of registered marks, or marks for which an application for registration has been filed, will be recorded in the Patent and Trademark Office. Other instruments which may relate to such marks may be recorded in the discretion of the Commissioner. No assignment will be recorded, except as may be ordered by the Commissioner, unless it has been executed and unless:

* * * * *

(2) It is in the English language or, if not in the English language, accompanied by a translation signed by the translator.

* * * * *

(4) A designation of a domestic representative is made in case the assignee is not domiciled in the United States. The designation must be separate from the assignment and there must be a separate designation for each registration or application assigned in one instrument.

* * * * *

§ 2.187 *Certificate of registration may issue to assignee.*

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, provided an appropriate document is of record in the Assignment Division of the Patent and Trademark Office no later than the time notice of publication is mailed, or a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration. The address of the assignee must be made of record in the application file.

§ 4.2 *Power of attorney accompanying application.*

Applicant hereby appoints _____
(8) _____ to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.
(Address)

NOTE: (8) Individual attorneys at law should be appointed. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

Dated: Jan. 28, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

DAVID B. CHANG,
Assistant Secretary for Science and Technology.

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Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,777,926, M. E. Bourns, VARIABLE RESISTOR, **filed** May 17, 1974, D.C., E.D. Pa. (Philadelphia), Doc. 74-1258, *Bourns, Inc. and Marlan E. Bourns* v. *Vishay Intertechnology, Inc.* **Same, filed** June 3, 1974, D.C., E.D. Pa. (Philadelphia) Doc. 74-1365, *Bourns, Inc. and Marlan E. Bourns* v. *Rcon Resistor.* **Same, filed** June 5, 1974, D.C. Mass. (Boston), Doc. 74-2025-8, *Bourns, Inc. et al.* v. *Carter Manufacturing Corp.* **Same, filed** June 3, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74-1530-AAH, *Marlan E. Bourns* v. *Bowmar/Tic Inc.* Plaintiff's notice of voluntary dismissal of action entered July 11, 1974.

2,919,990, Podlesak, Kraft and Miller, METHOD OF CONTINUOUSLY PRODUCING PACKAGED UNITS, **filed** Jan. 4, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74-4, *Kraftco Corporation* v. *Milwaukee Cheese Company, Sheboygan Sausage Company and Robert H. Zwicky.* **Same, filed** May 14, 1974. D.C., E.D. Wis. (Milwaukee), Doc. 74-187, *Kraftco Corporation* v. *Lake to Lake, Inc.* **Same, filed** June 13, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1624, *Kraftco Corporation* v. *Falbo Cheese Company.* **Same, filed** Sept. 3, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74-371, *Kraftco Corporation* v. *Hayssen Manufacturing Company.* **Same, filed** Sept. 13, 1974, D.C. Minn. (Minneapolis), Doc. 4-74-442, *Bemis Company, Inc.* v. *Kraftco Corporation.*

3,123,116, A. W. Hughes, EMULSIFIER; **3,221,788,** same; **3,318,353,** same, **filed** Feb. 5, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c314, *Alvin W. Hughes and A. W. Hughes Company, Inc.* v. *Hobam, Incorporated.* It is ordered that this cause be and the same is hereby dismissed with prejudice, subject to reinstatement within 30 days if settlement is not consummated, Nov. 15, 1973.

3,174,608, K. Knickerbocker, COIN CONTROLLED NEWSPAPER VENDING MACHINE, AND COIN CONTROLLED MEHCANISM ADAPTABLE THERETO, **filed** Sept. 16, 1974, D.C., M.D. Fla. (Tampa), Doc. 74-537-C T.K., *Kaspar Wire Works, Inc.* v. *Leco Engineering and Machine, Inc.*

3,196,330, J. Moyson, SEMICONDUCTOR DEVICES AND METHODS OF MAKING SAME; **3,275,909,** F. W. Gutzwiller, SEMICONDUCTOR SWITCH; **3,476,993,** Aldrich and Holonyak, FIVE LAYER AND JUNCTION BRIDGING TERMINAL SWITCHING DEVICE; **Re. 27,120,** J. Moyson, SEMICONDUCTOR DEVICES AND METHODS OF MAKING SAME, **filed** Sept. 10, 1974, D.C., N.D. Tex. (Dallas), Doc. CA3-74-879-C, *General Electric Company* v. *Hutson Industries, Inc.*

3,221,788. (See 3,123,116.)

3,224,201. J. L. Brunton, SHORING APPARATUS, **filed** Sept. 30, 1974, D.C. Ariz. (Phoenix), Doc. C-74-644 Phx, *Speed Shore Corporation* v. *Woudenberg Enterprises, Inc., doing business as Starlite Barricade & Sign, et al.* **Same, filed** Sept. 30, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74-2824, *Speed Shore Corporation* v. *John Denda, etc.*

3,245,280, G. M. Mooney, INTEGRAL GEAR; **3,248,782,** same, METHOD OF MAKING A ONE PIECE INTEGRAL/COMPOSITE GEAR, **filed** July 31, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74 323, *George M. Mooney* v. *Brunswick Corporation.*

3,248,782. (See 3,245,280.)

3,275,909. (See 3,196,330.)

3,301,746, Sanford and Sisson, PROCESS FOR FORMING ABSORBENT PAPER BY IMPRINTING A FABRIC KNUCKLE PATTERN THEREON PRIOR TO DRYING AND PAPER THEREOF, **filed** Oct. 2, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74-447, *Procter & Gamble Company* v. *American Can Company.*

3,318,353. (See 3,123,116.)

3,379,889, Barnett and Barnett, BEAN-DRIVEN GYROSCOPE DEVICE, **filed** Sept. 18, 1974, D.C., S.D. Ind. (Indianapolis), Doc. IP74-500-C, *Eugene R. Barnett and Willard L. Barnett* v. *United States of America, U.S. Department of Defense, U.S. Department of Air Force, U.S. Department of Navy and U.S. National Aeronautics and Space Administration.*

3,400,958, Haimes and Perryman, INTERLOCKING CLOSURE, **filed** Sept. 6, 1974, D.C., S.D. Fla. (Miami), Doc. 74-1128-C-Pf, *Plastimold, Inc.* v. *American Panel Corporation.*

3,432,058, H. A. Burgess, SAFETY CAP FOR MEDICINE BOTTLE OR THE LIKE, **filed** Oct. 2, 1974, D.C., N.D. Calif. (San Francisco), Doc. C-74-2101 RHS, *Glen H. Morris* v. *Diamond Intern'l Inc. and Lermer Packaging Inc.*

3,444,865, G. F. De Vita TRANSFORMATION WIG; **3,812,867**, Wanderman and Wanderman, CAPLESS WIG, **filed** Aug. 27, 1974, D.C., S.D.N.Y., Doc. 74–C–3722, *Carousel Fashions, Inc.* v. *D.S. of America, Inc.* **Same, filed** Aug. 27, 1974, D.C., S.D.N.Y., Doc. 74–C–3723, *Carousel Fashions, Inc* v. *Lord & Taylor.* **Same, filed** Aug. 27, 1974, D.C., S.D.N.Y., Doc. 74–C–3724, *Carousel Fashions, Inc.* v. *Gimbel Brothers of New York.*

3,476,993. (See 3,196,330.)

3,518,880, H. G. Tank, FLOORING SYSTEM, **filed** Sept. 19, 1974, D.C., W.D. Tenn. (Memphis), Doc. C–74–506, *Connor Forest Industries* v. *Robbins Flooring Co.*

3,528,428, B. Berkovits, DEMAND PACER, **filed** Sept. 30, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74–439, *American Optical Corporation* v. *General Electric Company.*

3,537,142, E. J. Villavicencio, APPARATUS AND METHOD FOR PROCESSING FIBROUS STALKS, **filed** Sept. 11, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–1938–ACW, *Rivenco Corp.* v. *W. R. Grace & Co.*

3,578,939, R. E. Green, BACKING GAS ATTACHMENT SAVING DEVICE FOR HELIARC WELDING, **filed** Apr. 5, 1974, D.C. Conn. (Hartford), Doc. H–74–111, *Randolph E. Green* v. *The Pratt & Whitney Aircraft Division of United Aircraft Corporation.*

3,614,287, P. A. Klann, MULTIPLEXING ARRANGEMENT FOR ELECTRONIC ORGANS, **filed** May 13, 1974, D.C. Oreg. (Portland), Doc. C–74–368, *Klann, Inc.* v. *Rodgers Organ Company.* **Same, filed** May 13, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–1296–WMB, *Klann, Inc.* v. *Allan Organ Company and Rockwell International Corp.* Filed stipulation disqualifying the firm of Ambrose & Silber from participating on behalf of Klann, Inc. Complaint and counterclaim are dismissed without prejudice, entered Sept. 6, 1974.

3,636,903, Anderson and Munn, RECTANGULAR-DUCT FORMING MACHINE; **3,757,830**, same, RECTANGULAR AIR DUCT; **Re. 28,088**, same, METHOD OF FORMING A RECTANGULAR HEAT DUCT, **filed** Sept. 12, 1974, D.C., N.D. Ala. (Birmingham), Doc. 74–H–922–S, *Manufacturers Systems, Inc.* v. *Posey Supply Co., Inc., Posey Electrical & Supply Co., Donald S. Posey and James H. Posey.*

3,645,463, F. R. Helm, WEB-SPLICING APPARATUS, **filed** Oct. 1, 1974, D.C.N.J. (Newark), Doc. C–74–1511, *Champion-Edison, Inc.* v. *Compensating Tension Controls, Inc.*

3,676,966, D. Ragland, DOOR-FRAME ASSEMBLY, **filed** Sept. 4, 1974, D.C., S.D. Tex. (Houston), Doc. CA 74–H–1199, *Ragland Mfg. & Construction Co.* v. *Flexible Walls, Inc.*

3,738,836, R. L. Dalton, PROCESS OF MAKING IDENTIFICATION CARDS, **filed** June 28, 1973, D.C., M.D. Fla. (Jacksonville), Doc. 73–511–C–J–T, *Percy Rosenbloom, Jr.* v. *Central Florida Merchandise Mart, Inc.* Case dismissed with prejudice, Sept. 11, 1974.

3,757,830. (See 3,636,903.)

3,783,449, R. C. Davis, BULLET-PROOF PROTECTIVE ARMOR AND METHOD OF MAKING SAME, **filed** Sept. 10, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–1919 LHB, *Second Chance Body Armor, Inc.* v. *Gerald D. Cochran, doing business as Narco-Data.*

3,812,867. (See 3,444,865.)

Re. 27,120. (See 3,196,330.)

Re. 28,088. (See 3,636,903.)

Certificates of Correction for the Week of Mar. 11, 1975

3,422,615	3,822,643	3,842,401	3,852,871
3,466,729	3,822,718	3,843,360	3,852,959
3,624,782	3,823,821	3,843,452	3,853,124
3,658,043	3,824,118.	3,843,593	3,853,140
3,670,026	3,824,797	3,843,717	3,853,277
3,693,276	3,825,905	3,843,807	3,853,286
3,698,536	3,826,066	3,844,030	3,853,552
3,699,126	3,828,033	3,845,222	3,853,803
3,733,309	3,830,840	3,845,912	3,853,909
3,738,790	3,831,111	3,846,397	3,854,141
3,741,683	3,833,318	3,846,689	3,854,613
3,749,878	3,833,332	3,846,855	3,855,101
3,753,785	3,833,502	3,847,225	3,855,103
3,754,482	3,834,263	3,847,373	3,855,108
3,775,114	3,834,311	3,848,234	3,855,120
3,777,318	3,834,907	3,848,518	3,855,235
3,779,027	3,835,073	3,848,568	3,855,424
3,790,477	3,835,387	3,848,808	3,855,630
3,791,829	3,835,942	3,848,850	3,855,636
3,792,466	3,836,358	3,849,019	3,855,753
3,795,295	3,836,491	3,849,115	3,855,778
3,799,744	3,837,754	3,849,151	3,856,599
3,800,661	3,837,978	3,849,259	3,856,762
3,801,019	3,838,032	3,849,408	3,856,818
3,801,605	3,838,400	3,849,506	3,856,945
3,801,902	3,838,682	3,849,589	3,856,962
3,802,090	3,838,890	3,849,674	3,857,471
3,802,557	3,839,041	3,849,728	3,857,541
3,803,169	3,839,207	3,850,114	3,858,083
3,806,485	3,839,232	3,850,184	3,858,278
3,807,837	3,839,315	3,850,240	3,858,485
3,808,406	3,839,360	3,850,496	3,859,025
3,810,792	3,839,537	3,850,587	3,859,597
3,811,407	3,839,706	3,850,680	3,859,609
3,812,108	3,839,855	3,850,983	3,859,792
3,813,754	3,839,969	3,851,314	3,859,803
3,816,367	3,840,452	3,851,440	3,860,001
3,816,455	3,840,677	3,851,787	3,860,274
3,817,068	3,841,189	3,852,121	3,860,467
3,819,475	3,841,350	3,852,250	3,860,488
3,820,999	3,841,379	3,852,359	3,860,778
3,821,176	3,841,421	3,852,377	3,860,780
3,821,230	3,841,554	3,852,398	3,860,934
3,821,552	3,841,619	3,852,774	3,861,160
3,822,202	3,842,123	3,852,798	3,861,244
3,822,317	3,842,289	3,852,842	3,861,453

Availability of Patents Official Gazette January 28, 1975, Volume 930/No. 4

Additional copies of the January 28, 1975, Patents OFFICIAL GAZETTE containing Patent Applications published under the Trial Voluntary Protest Program are available for public distribution.

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WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Feb. 18, 1975.

Dedications

2,932,590.—*Robert E. Barrett, Earl R. Olson* and *Paul Schall, Jr.*, Columbus, Ohio. INDIUM OXIDE COATINGS. Patent dated Apr. 12, 1960. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

2,987,554.—*Arthur Levy*, Worthington, Ohio, and *Earl A. Weilmuenster*, Kenmore, N.Y. PROCESS FOR PREPARING A LIQUID REACTION PRODUCT OF AN ALKYL HALIDE AND A PENTABORANE. Patent dated June 6, 1961. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,196,989.—*Robert M. Conklin*, Muskegon, Mich. SPEED CONTROL DEVICE. Patent dated July 27, 1965. Dedication filed Aug. 2, 1974, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,231,396.—*Herbert K. De Long* and *Charles W. Glesner*, Midland, and *James A. Brown*, Essexville, Mich. STANNATE IMMERSION COATING FOR MAGNESIUM, MAGNESIUM-DISSIMILAR METAL COUPLES, AND OTHER METALS. Patent dated Jan. 25, 1966. Dedication filed Aug. 9, 1974, by the assignee, *The Dow Chemical Company.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

2,836,725.—*Robert G. Vyverberg*, Pittsford, N.Y. CORONA CHARGING DEVICE. Patent dated May 27, 1958. Disclaimer filed Oct. 3, 1974, by the assignee, *Xerox Corporation.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,321,811.—*Karl Thomas*, Bergsdorf, Germany. METAL CLAMPING BAND. Patent dated May 30, 1967. Disclaimer filed Feb. 6, 1975, by the assignee, *Jurid Werke G.m.b.H.*

Hereby enters this disclaimer to all claims of said patent.

3,674,971.—*William A. Emerson* and *John A. Redmond*, Ellicott City, Md. INDUCTION HEATING COIL CONSTRUCTED TO MINIMIZE VIBRATION AND NOISE. Patent dated July 4, 1972. Disclaimer filed Oct. 26, 1973, by the assignee, *United States Steel Corporation.*

Hereby enters this disclaimer to claims 1 to 6 of said patent.

3,679,381.—*Hyman Chessin*, Birmingham, Mich. NOVEL COMPOSITE. Patent dated July 25, 1972. Disclaimer filed July 26, 1974, by the assignee, *M & T Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 8, 9, 10 and 11 of said patent.

3,706,560.—*Clark F. Grain*, Framingham, Mass. IMAGE RECORDING MATERIAL CONTAINING TITANIUM DIOXIDE AND ZINC OXIDE IN MINOR AMOUNT AND THE USE THEREOF. Patent dated Dec. 19, 1972. Disclaimer filed Feb. 6, 1974, by the assignee, *Itek Corporation.*

Hereby enters this disclaimer to claims 1, 7, and 14 of said patent.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 15, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-6-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-11-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-6-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-13-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-10-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-22-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-22-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-10-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-27-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-23-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-13-74

Expiration of patents: The patents within the range of numbers indicated below expire during March 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,825,064 to 2,828,486, inclusive
Plant Patents..... Numbers 1,686 to 1,693, inclusive

REISSUES

MARCH 11, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,361
POLYMER PIGMENTATION

Granville J. Hahn, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

No Drawing. Original No. 3,632,369, dated Jan. 4, 1972, Ser. No. 884,353, Dec. 11, 1969, which is a continuation-in-part of applications Ser. No. 525,854, Feb. 8, 1966, Ser. No. 576,208, Aug. 31, 1966, both now abandoned, and Ser. No. 594,998, Nov. 17, 1966, now Patent No. 3,484,262. Application for reissue June 20, 1973, Ser. No. 371,780

Int. Cl. B05c *5/00;* **B44d** *1/02*

U.S. Cl. 117—16 **13 Claims**

1. Pigmented polymer particles, said polymer particles having a pigment abrasively adhered to the surfaces thereof by mixing the polymer particles and dry powdered pigment in a rotary blade mixer having a tip speed exceeding about 200 inches per second, said polymer particles having a screen mesh size of about 20 to 200 U.S. Standard sieve and being selected from the group consisting of polyethylene, polypropylene, polymerized lower alkyl ester of acrylic acid in which the lower alkyl ester group has one to four carbon atoms, and polymerized lower alkyl ester of methacrylic acid in which the lower alkyl ester group has one to four carbon atoms.

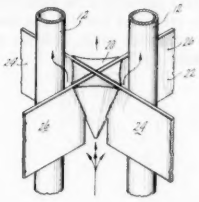
28,362
FLOW DEFLECTOR FOR NUCLEAR FUEL ELEMENT ASSEMBLIES

John Norman Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Original No. 3,663,367, dated May 16, 1972, Ser. No. 889,548, Dec. 31, 1969. Application for reissue Dec. 26, 1972, Ser. No. 317,977

Int. Cl. G21c *3/30*

U.S. Cl. 176—78 **4 Claims**



10. A nuclear reactor fuel assembly comprising a plurality longitudinally extending parallel fuel elements arranged in spaced rows forming longitudinal coolant flow channels therebetween; a grid formed from a plurality of cross-laced interengaging straps, each of said straps being located between said spaced rows of fuel elements; and a plurality of deflector cones located in said flow channels between said fuel elements, said cones being attached to said grid at the intersections of said straps, said cones each being generally pyramidal in shape having an apex and a generally square base and four deflecting sidewall surfaces, each of said sidewall surfaces being oriented so as to face the adjacent fuel element and each sidewall surface being concave with the center of curvature of said concavity generally corresponding to the center of said adjacent fuel element whereby an intermittent annular space is formed between each fuel element and the adjacent deflector cones, the apex of said cones being located upstream and said base being located downstream with respect to the direction of said coolant flow.

28,363
TOOTHPASTE

Henning Asche, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original No. 3,691,272, dated Sept. 12, 1972, Ser. No. 74,528, Sept. 22, 1970, which is a continuation-in-part of abandoned application Ser. No. 6,032, Jan. 23, 1970, which is a continuation of abandoned application Ser. No. 608,736, Jan. 12, 1967. Application for reissue Sept. 10, 1973, Ser. No. 395,518

Int. Cl. A61k *7/16*

U.S. Cl. 424—57 **7 Claims**

1. An aqueous toothpaste composition consisting essentially of:

12–17% of a salt selected from the group consisting of sodium chloride and marine salt;

0.5–2.5% of a gelling agent selected from the group consisting of hydroxyethyl cellulose, hydroxymethyl cellulose and mixtures thereof;

1.4–2.5% of colloidally dispersed silica;

5–20% of glycerol;

0.1–1% of a condensation product of ethylene oxide and polyoxypropylene glycol having a molecular weight of about 8700 and consisting of 20 weight-percent hydrophobic polyoxypropylene glycol moiety of about 1500–1800 molecular weight and about 80 weight-percent polyoxyethylene moiety;

15–35% of a polishing agent selected from the group consisting of dicalcium phosphate dihydrate, calcium orthophosphate and sodium metaphosphate, and mixtures thereof; a sweetener selected from the group consisting of

0.03–0.3% of the sodium salt of saccharine,

0.3–1.5% of sodium cyclamate and

0.4–1.5% of mixtures thereof;

0.1–1.5% of toothpaste flavoring;

and an amount of water such that the total amount of ingredients in said toothpaste composition is 100 percent, all percentages being by weight and based on the total weight of said toothpaste, said sodium chloride being in solution, said gelling agent and said silica being present in an amount such that a homogenous and pasty consistency is obtained, the total amount of said gelling agent and said silica combined being about 3.5 percent by weight of the toothpaste, said condensation product being present in an amount such that one part of said toothpaste diluted in 20 parts of water has a surface tension of about 45 to 60 dynes/cm.

PLANT PATENTS

GRANTED MARCH 11, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,688
CACTACEAE PLANT
Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.
Filed Jan. 18, 1974, Ser. No. 434,450
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct hydrib plant variety of the Cactaceae family as described and illustrated and which is principally distinguished by a growth habit that combines the following characteristics:

(1) A faster growth rate than its maternal parent,
(2) A more upright and compact appearance than its parents,
(3) Broader cladophylls than its maternal parent,
(4) Substantially less flower bud abscission than its maternal parent,
(5) Greater resistance to nutrient deficiencies and fungus-type diseases than its parents, and
(6) A generally larger flower than its maternal parent and which has
  (a) a bloom life from about 5 to about 8 days,
  (b) perianth tube laminating tepals with marginal blade areas that in color are dominated by yellowish pink, pink, red and/or purplish red hues, and
  (c) perianth tube forming tepals with blades that are more recurved than those of the maternal parent and have marginal blade areas which in color are dominated by purplish red, red and/or pink hues.

3,689
BROMELIACEAE PLANT—*CRYPTANTHUS BIVITTATUS MINOR* (cv) PINK STARLIGHT
Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.
Filed Jan. 28, 1974, Ser. No. 437,317
Int. Cl. A01h *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the Bromeliaceae family as illustrated and described and which is principally distinguished by a growth habit that combines the following characteristics:

1. Elongated leaves which have prominent albino marginal areas that in color are dominated by red, pink and/or yellowish pink hues when subjected to prolonged light exposure and which have an intervening prominent chlorophyllous center area that generally extends along and laterally of the leaf axis and has striations which in varying degrees exhibit albino characteristics, and
2. An influorescence which has fewer and lighter colored flowers with fewer ovules than specimens of the *Cryptanthus bivittatus minor* variety.

3,690
CACTACEAE PLANT
Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.
Filed Jan. 25, 1974, Ser. No. 436,441
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct hybrid plant variety of the Cactaceae family as desribed and illustrated and which is principally distinguished by a growth habit that combines the following characteristics:

1. a faster growth rate than specimens of the "Christmas Cheer" variety,
2. substantially greater resistance to flower bud abscission than specimens of the "Christmas Cheer" variety,
3. broader, longer and thicker cladophylls than specimens of the "Christmas Cheer" variety,
4. a more upright and compact appearance than specimens of the "Christmas Cheer" variety,
5. greater resistance to nutrient deficiencies and fungus-type diseases than specimens of the "Christmas Cheer" variety, and
6. a flower which has a bloom life from about 6 to about 8 days and perianth tube laminating and forming tepals with marginal blade areas that in color are dominated by purplish pink, reddish purple and/or purplish red hues.

PATENTS

GRANTED MARCH 11, 1975

ERRATA

For CLASS	See PATENT NO.
128-188	3,869,771
070-432	3,869,901
072-304	3,869,917
313-038	3,870,002
166-055	3,870,098
337-347	3,870,229
346-074	3,870,257
285-035	3,870,332
339-048	3,870,385
117-036	3,870,435
096-029	3,870,479
264-42	3,870,588
264-46	3,870,741
178-007	3,870,814
260-023	3,870,841
357-049	3,871,007
357-079	3,871,008

PATENTS

GRANTED MARCH 11, 1975

GENERAL AND MECHANICAL

3,869,726

GLOVE LINER AND GLOVE COMPRISING SUCH LINER

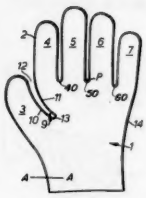
Alfred Wharton Bell, Ash near Aldershot, England, assignor to Siebe Gorman & Company Limited, Chessington, Surrey, England

Filed July 19, 1973, Ser. No. 380,761

Claims priority, application Great Britain, July 19, 1972, 33850/72

Int. Cl. A41d *19/00*

U.S. Cl. 2—164 **8 Claims**



1. A liner for a glove which comprises two generally hand-shaped pieces of an absorbent knitted fabric united together around a portion of their margins, a heat-weldable coating on one side of each of said pieces which is bonded to said fabric, a heat-welded joint uniting the coated sides of sjaid pieces around said portion of their margins, an indentation between the thumb stall and the first finger stall of each of said pieces in the form of an open-ended slot, the center line of which curves in towards the center of the liner and extends below the first finger stall, the sides of the slot being substantially uniformly spaced from each other along the length of the slot until they terminate in a rounded end portion.

3,869,727

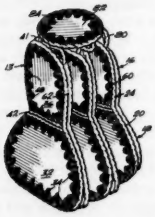
FOLDABLE HAT

John R. Hartman, 310 S.W. 30th Ct., and Dorsey Summerlin, 3850 N.W. 13th St., both of Miami, Fla. 33135

Filed July 2, 1973, Ser. No. 375,915

Int. Cl. A42b *1/20*

U.S. Cl. 2—175 **3 Claims**



1. A collapsible hat composed of a plurality of interconnected sections, each section including a crown wall defining portion and a brim portion, hinge means interconnecting adjacent sections whereby the sections are adapted to be collapsed into stacked relation defining a compact, collapsible hat, said hat including a crown portion connected to the upper end zone of each of the crown walls defining portions and being spaced therefrom, and an open-work collapsible, plurality of strings interconnecting the sections and the crown portion, and each of the portions of said section being interconnected by hinge means, whereby, when the hat is an opened condition, the brim portions extend outwardly from the main plane of the associated crown wall portion of the section defining a decorative hat brim and the hat is adapted to be collapsed into a folded, stacked relation, said crown wall portions being generally rectangular in shape and said brim portions being generally trapezoidal in shape.

3,869,728

WAISTBAND CONSTRUCTION

Benjamin F. Spencer, Manhattan, N.Y., assignor to Spencer Industries, Inc., New York, N.Y.

Filed June 17, 1974, Ser. No. 480,091

Int. Cl. A41f *9/02*

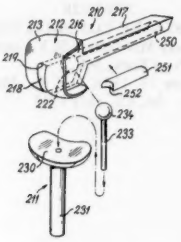
U.S. Cl. 2—221 **12 Claims**

1. In a garment having an upper section intended to encircle the waist of a wearer, the garment including body fabric formed to provide the outer exposed body encasing portion of the garment, a waistband construction for the garment, the waistband construction including the upper portion of said formed body portion, a band extensible elastically lengthwise of the waistband, the band being relatively unstretchable in its width, said body fabric being folded over at its upper extremity and downwardly within the garment for a short distance to form a pocket, the upper edge of said band being fitted into said pocket, a plurality of bias cut fabric pieces, extensible means for securing the bias pieces together and to said band closely adjacent to the bottom edge of said band, one of said bias cut pieces extending upwardly from its securement position to conceal the band and the bias cut pieces securing means, said one bias cut piece having its top edge secured to the folded over fabric, the bias cut pieces securing means being secured to said band above its bottom edge, a second one of said bias cut pieces extending from the position of securement adjacent the bottom edge of said band and being separately extensibly secured to said body fabric to hold the band in position to permit the band to transmit its elastic effect to said waistband.

3,869,729
BONE JOINT PROSTHESIS

Christopher George Attenborough, Winchelsea, England, assignor to National Research Development Corporation, London, England

Filed Dec. 29, 1972, Ser. No. 319,480
Claims priority, application Great Britain, Jan. 5, 1972, 484/72; Apr. 17, 1972, 17610/72
Int. Cl. A61f 1/24
U.S. Cl. 3—1 10 Claims

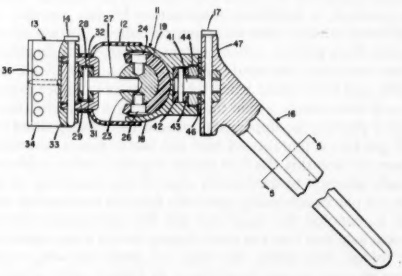


7. An endoprosthetic bone joint device comprising:
a first component having a first bearing surface and a slot in such surface, which slot terminates in an enlarged cavity located remotely within said first component from said first surface;
a second component having a second bearing surface in mutual articulatory engagement with said first surface, and a bore extending into said second component from its bearing surface; and
a linkage member including a shaft terminated at one end in an enlarged head, said head being captively movably housed in said cavity, part of said shaft adjacent said head being movably located in said slot, and the end of said shaft remote from said head being separably longitudinally slidably engaged in said bore.

3,869,730
SURGICALLY IMPLANTABLE JOINT PROSTHESIS

Barry A. Skobel, 10 Lynwood Rd., Edison, N.J. 08817

Filed July 25, 1973, Ser. No. 382,300
Int. Cl. A61f 1/24
U.S. Cl. 3—1 10 Claims

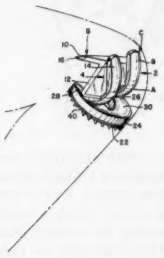


1. A surgically implantable joint prosthesis comprising
a gimbal housing,
a gimbal ring pinned at first axially opposite points to said housing,
an inner body pinned to said ring at opposite sides thereof on an axis perpendicular to said first axially opposite points,
first bone securing means rotatably attached to said housing, and
second bone securing means rotatably attached to said inner body.

3,869,731
ARTICULATED TWO-PART PROSTHESIS REPLACING THE KNEE JOINT

Theodore R. Waugh; Richard C. Smith, both of Irvine; Sanford H. Anzel, Orange, and Caesar F. Orofino, Orange, all of Calif., assignors to The Regents of the University of California

Filed Feb. 14, 1973, Ser. No. 332,509
Int. Cl. A61f 1/24
U.S. Cl. 3—1 3 Claims



1. A two-part prosthetic device for arthoplasty of the knee joint, comprising a component for replacing at least a part of the distal end of the femur and a component for replacing at least a part of the proximal end of the tibia, the femoral component comprising a unitary integrally formed device constructed and adapted to be connected to the distal end of the femur and serve in lieu of the condyle surfaces thereof, said femoral component having an upper part having an upwardly directed bone fixation element for upward implantation in the femur shaft and a lower part providing two substantially parallel transversely spaced support members which serve in lieu of the natural condyles, each of said support members having a downwardly facing bearing surface the anterior to posterior shape of which is a continuously changing curve of constantly decreasing radii and the transverse cross sectional shape of which is a curve forming part of a circle and of shallow depth, the tibial component being disc shaped and having upper and lower surfaces and a side wall and being constructed and adapted to lie with its lower surface on and connected to the prepared plateau surface of the proximal tibia, the tibial component having an opening extending from the posterior part of its side wall to its center whereby the component is C-shaped, the tibial component having a groove in its upper surface which is C-shaped in plan, following the C-shape of the component, to receive the support members of the femoral component, the groove being of uniform cross sectional shape and shallow depth throughout its length and its bottom shaped in each transverse cross section as a curve forming part of a circle.

3,869,732
SELF-CLEANING RESTROOM

Glenwood L. Garvey, Los Angeles, and Richard J. Begley, Thousand Oaks, both of Calif., assignors to Self-Cleaning Environments, Los Angeles, Calif.

Filed Mar. 6, 1974, Ser. No. 448,498
Int. Cl. A47k 17/00
U.S. Cl. 4—1 5 Claims

1. An improvement in a self-cleaning restroom of the type which has a toilet and a lavatory changed in position from an in-use position into a nesting relationship for automatic clean-

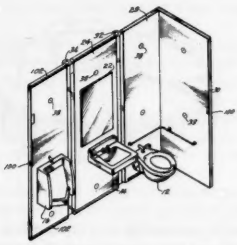
ing and means to clean these fixtures in their nesting relationship with a fluid solution, the improvement comprising:

a. lavatory support means carrying the lavatory;

b. means for rotating the lavatory support means into a position where the lavatory and the toilet are in the nesting relationship;

c. means for mounting the toilet in a stationary position;

d. stationary and non-rotatable plumbing means to the toilet;



e. plumbing means to the lavatory including plumbing lines and means for rotating a portion of the plumbing lines with the lavatory and with respect to a stationary portion of the plumbing lines; and

f. the cleaning means includes cleaning lines and means for rotating a portion of such lines with the lavatory and with respect to a stationary portion of the cleaning lines.

3,869,733

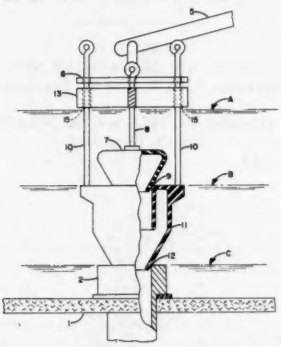
MULTI LEVEL HOLDING TANK DISCHARGE SYSTEM

Chester A. White, 813 Ram Trl. S.E., Albuquerque, N. Mex. 87123

Filed June 4, 1973, Ser. No. 366,267

Int. Cl. E03d *1/34, 5/02*

U.S. Cl. 4—67 A **2 Claims**



1. A discharge system for a fluid holding tank such as is used on a water closet flushed toilet having a maximum fluid level control such as a float operated valve, a discharge fitting with a float valve seat and an associated vertical overflow pipe a short distance from the center of the discharge valve seat, a flow through ball check valve seating on the discharge fitting valve seat, the flow through ball check valve having a valve seat at the top of the flow through opening designed to accomodate another ball check valve; a conventional ball check valve seated on the valve seat at the top of the flow through ball check valve; the conventional ball check valve having a valve stem extending vertically upward on its axis and passing through a vertical guide hole in a valve stem guide attached as by clamping to the overflow pipe, the guide hole being concentric with the vertical axis of the discharge valve seat, thus controlling the upward and downward movement of that valve to cause it to seat properly when returning to the discharge valve seat; means for selectively raising the top ball check valve from the discharge seat on the top of the flow through ball check valve thus limiting the discharge to the level of the discharge valve seat on the top of the flow through ball check valve; and means for raising the flow through ball check valve and the ball check valve seated on the discharge valve seat on the top thereof, and permitting discharge of the entire contents of the holding tank; wherein the improvement comprises:

means for controlling the upward and downward movement of the flow through ball check valve, so as to cause it to seat properly when returning to its seat, comprising:

the valve stem guide having, spaced symetrically about the axis of the discharge valve seat, a pair of vertical guide holes for valve stems of the flow through ball check valve; the flow through ball check valve having two valve stems located symetrically about its vertical axis and extending vertically upward through the guide holes provided therefor in the valve stem guide.

3,869,734

SHOWER CABINETS

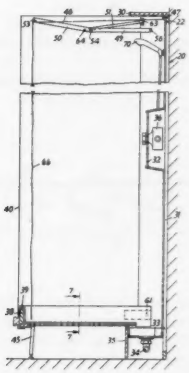
Harry Collett Bolt, and John Anthony Bolt, both of Woodbrook Penn Rd. Knotty Green, Beaconsfield, Buckinghamshire, England

Continuation of Ser. No. 222,164, Jan. 31, 1972, abandoned. This application Oct. 2, 1973, Ser. No. 402,915

Claims priority, application Great Britain, Feb. 9, 1971, 4226/71

Int. Cl. A47r *3/23*

U.S. Cl. 4—146 **6 Claims**



1. A shower cabinet which is collapsible so that when not in use it occupies a space smaller than the front-to-back depth required to accomodate a person taking a shower but can readily be opened to provide a space to accomodate such a person, said cabinet including a back structure of smaller depth than said space, a tray pivotally attached to the back structure and movable from a collapsed vertical position adjacent the back structure to a forwardly extended approximately horizontal position near floor level, two side walls pivotally attached to the back structure on vertical axes and movable from collapsed positions adjacent the back structure to forwardly extended positions approximately at right angles to the back structure, an overhead transverse horizontal support member, foldable linkage means including a first linkage mounted on the cabinet and a second linkage hinged thereto and carrying said member, said linkage means being arranged

to convey said member from the back of the cabinet to the front of the cabinet by extending the linkage means from a position adjacent the back structure where the linkages are folded on each other into a forwardly extended approximately horizontal overhead position which is approximately in the same transverse vertical plane as the front edge of the extended tray whereby the forward and retracted positions of said horizontal support member are in a common horizontal plane, means to prevent escape of water between the two side walls when extended and the tray, a front closure member having its top edge carried by said support member and movable thereby from a retracted position adjacent the back structure to a position at the front of the cabinet in the extended position in which the front closure member is supported in both forward and retracted positions in approximately fully extended condition vertically, and connecting means operatively connecting the foldable linkage means with the tray whereby movement of the tray to its extended and retracted positions automatically moves the linkage means to bring the front closure member to its extended and retracted positions respectively.

3,869,735

SHOWER DOOR SADDLE

Nicholas J. D'Amato, 2840 Braidwood, Richmond, Va. 23225

Filed Mar. 15, 1974, Ser. No. 451,385
Int. Cl. A47k *3/22*
U.S. Cl. 4—146 **8 Claims**

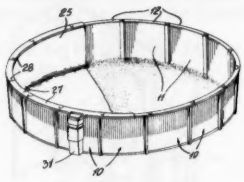
1. A shower door saddle for providing a raised dam at the foot of a door opening of a shower stall and for retaining a tile covering comprising an elongated tubular member of a predetermined length sufficient to close the foot of a door opening in a shower stall, said tubular member having a flat base, a pair of parallel side walls perpendicular to said base and a top wall parallel to said base, said side walls being spaced apart and integrally joining said base and top wall, and a pair of integral longitudinal nailing strips extending perpendicular to and laterally outwardly of said side walls adjacent said base, said side walls and top wall having alternating, parallel longitudinal ribs and grooves formed in the exterior surfaces thereof to provide mechanically interlocking means for retaining tile setting adhesive applied to the exterior surfaces of the top wall and side walls.

3,869,736

COLLAPSIBLE SWIMMING POOL

Marcel Valois, and Kenneth Valois, both of Laval sur Le Lac, Quebec, Canada, assignors to Valmar Swimming Pools Ltd., Ville De Laval (Chomedey), Quebec, Canada

Continuation of Ser. No. 133,629, April 13, 1971, abandoned.
This application Feb. 8, 1974, Ser. No. 440,864
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 **9 Claims**



1. A collapsible swimming pool comprising:

a plurality of arcuately curved smooth surfaced wall panels of fiberglass reinforced plastics sheet-like material arranged in edge to edge relation to define a cylindrical wall;

one edge portion of each panel being further curved to define an inwardly facing groove extending along said edge portion and the adjacent panel having a correspondingly further curved edge portion seated in said groove; means filling the groove in said adjacent panel to define a substantially smooth inner surface coextensive with the inner surfaces of said panels;

a reinforcing rib structure extending along the joint between adjacent panels at the outer surface of said wall;

removable securing means holding said edge portions, groove filling means and reinforcing ribs in the described relationship; and

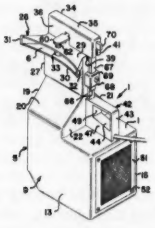
a water-impermeable liner for said pool secured to the top edge of said wall and extending thereover.

3,869,737

TOILET STOOL AIR DEODORIZER STRUCTURE

Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212

Filed Oct. 23, 1973, Ser. No. 408,439
Int. Cl. E03d *9/04*
U.S. Cl. 4—213 **5 Claims**



1. A deodorizer device for a toilet having a toilet bowl with an enlarged rim at the upper end thereof and a toilet seat hingedly mounted on said bowl and having limited movement toward said bowl and a predetermined minimum space between said seat and rim comprising:

a. a housing having an air outlet and a fan means and a filter unit therein arranged for support from a floor along side a toilet, said housing having a reduced upstanding duct portion and permitting air flow through the duct portion, fan means and filter unit to said air outlet;

b. an inlet member having a wide generally flat portion extending between a toilet bowl rim and seat and having an inlet opening facing said bowl, said inlet member having a depending tubular duct telescopingly and adjustably engaged with said upstanding duct portion for adjusting the height of said flat portion to accommodate the height of said toilet with said upstanding duct portion;

c. resilient means engaging said toilet seat and operative to swing same upwardly to a selected spacing from the bowl rim when in unloaded condition and permit the seat to be depressed to its minimum spacing when weight is applied thereto;

d. switch means in the housing and having electrically conductive components with one being movable and operative to make and break an electric circuit to said fan means;

e. actuating means on the inlet member and having a movable arm extending under the toilet seat for operation thereby in response to up and down movement of said seat;

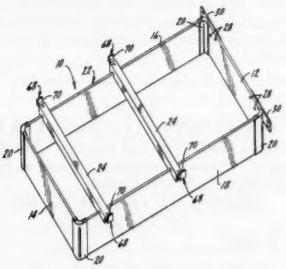
f. means including a link connecting the actuating means to the movable switch component to move same and make the electric circuit to the fan means when the seat is depressed, and to break said circuit when the seat is raised, said link including means for adjusting its length to accommodate the height adjustment of the inlet member. .

3,869,738

BED BASE FOR SUPPORTING A BOX SPRING

James Rogers Lawrence, Carthage, Mo., assignor to Steadley Company, Incorporated, Carthage, Mo.

Filed Jan. 11, 1974, Ser. No. 432,659
Int. Cl. A47c *19/00*
U.S. Cl. 5—200 R **12 Claims**



1. A bed base for supporting a box spring for a mattress and elevating said box spring a predetermined distance above a floor, comprising

panels of equal width resting on their edges and connected at their ends to form a rectangular frame,

a pair of notches in a pair of opposed panels at the upper edges in each one of said opposed panels, said pair of notches in one panel being in registration with the pair of notches in the other panel, and

a pair of spaced cross-supports resting crosswise between the pair of notched panels, each of said cross-supports having a generally flat support surface which is generally parallel to the floor and on which the box spring rests, and a downwardly pointing brace,

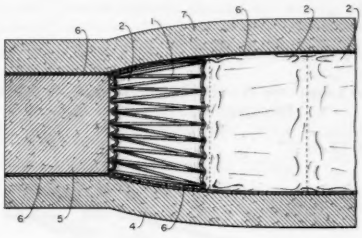
each of said cross-supports being at right angles to the notched panels and aligned with opposed notches in opposed notched panels so that the respective braces of each one of said cross-supports nest in the opposed notches and the support surfaces of said cross-supports are essentially flush with the unnotched portion of the notched edges of said panels.

3,869,739

CUSHION OR MATTRESS CONSTRUCTION

Donald L. Klein, Los Angeles, Calif., assignor to Marspring Corporation, Los Angeles, Calif.

Filed Nov. 16, 1973, Ser. No. 416,534
Int. Cl. A47c *27/04, 27/20*
U.S. Cl. 5—353 **2 Claims**



1. A cushion or mattress comprising:

an encasing structure defining an enclosed cavity and having top and bottom walls formed of latex or urethane foam material;

a plurality of coil springs and a corresponding plurality of synthetic fabric casings for said coil springs completely filling said cavity in side-by-side relationship with said coil springs extending between said top and bottom walls and completely enclosed by said casings, in which said synthetic fabric includes olefin, nylon and polyester; and

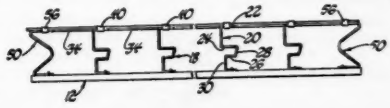
a thin adhesive layer bonding said casings to the interior surface of each of said top and bottom walls.

3,869,740

SPRING ASSEMBLY

Zygmunt M. Surletta, Detroit, Mich., assignor to Lear Siegler Inc., Detroit, Mich.

Filed Sept. 30, 1970, Ser. No. 76,722
Int. Cl. A47c *23/04*
U.S. Cl. 5—354 **2 Claims**



1. A spring assembly comprising: frame means; a plurality of spring members supported on said frame means to define a supporting area, each of said spring members being defined by an integral wire having a straight section and a fishmouth section at each end thereof, at least some of said fishmouth sections being disposed about the periphery of said supporting area; a first pad assembly including first and second border wire sections extending along first and second opposite extremities of the periphery of said supporting area and attached to at least some of said fishmouth sections to define the only border wire means along said first and second opposite extremities; a second pad assembly including third and fourth border wire sections extending along third and fourth opposite extremities of the periphery of said supporting area between the border wire sections of said first pad assembly and attached to at least some of said fishmouth sections to define the only border wire means along said third and fourth opposite extremities; a first plurality of spaced wire cross strands extending between and attached to said first and second border wire sections; a second plurality of spaced wire cross strands extending between and attached to said third and fourth border wire sections; a first plurality of spaced pliable cords

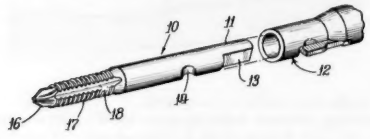
extending across said first plurality of spaced wire cross strands and attached thereto; a second plurality of spaced pliable cords extending across said second plurality of space wire cross strands and attached thereto; and a corner spring disposed at each corner of said frame means, each corner spring being arcuate as viewed in plan and including a first portion connected to said frame means and an arcuate second portion.

3,869,741

COMBINATION THREADING AND SCREW DRIVER TOOL

Noel Logan, 406 Waverly Rd., Barrington, Ill. 60010

Filed June 8, 1973, Ser. No. 368,230
Int. Cl. B25f *1/00*
U.S. Cl. 7—17 **1 Claim**



1. In a screwdriver bit having a distal end and a proximal end with the distal end having a screw engaging configuration, the improvement comprising:

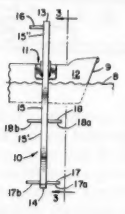
said bit having a portion between said distal end and said proximal end with external threads and forming a tap, said threads having a root at least as large in diameter as the largest diametrical measurement of said configuration.

3,869,742

LADDER AND MOUNTING FOR SMALL BOATS

William F. Gale, Box 11a, River Rd., Wapwallopen, Pa. 18660, and James Douglas Thompson, Berwick, Pa., assignors to Gale by said Thompson

Filed Feb. 28, 1974, Ser. No. 446,768
Int. Cl. E06c *1/36*
U.S. Cl. 9—1 R **6 Claims**



1. An improved ladder and mounting for small boats comprising in combination a single shaft ladder having top and bottom ends and bracket engaging means secured to the shaft intermediate said top and bottom ends and dividing said ladder into top and bottom end portions, and a bracket adapted to be secured near the top edge of the transom of a boat for supporting said ladder angularly inclined with respect to the transom with the bottom end portion of the ladder extending in a downwardly diverging direction with respect to the transom and with said top end portion extending above and over the top edge of the transom, said ladder having sets of laterally extending opposite rungs spaced along the bottom portion of the ladder, and a single rung laterally extending from one side of said ladder providing a handle near the top end of the ladder.

3,869,743

KAYAK

Michael A. Brown, 513 Windsor Dr., West Carrollton, Ohio 45418, and Steven F. Shade, 5412 Dunmore, Centerville, Ohio 45459

Filed July 14, 1972, Ser. No. 272,057
Int. Cl. B63b *7/00*
U.S. Cl. 9—2 C **7 Claims**

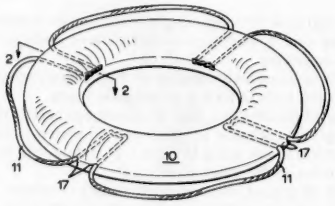
1. A watercraft providing a hull relatively broad intermediate its ends and tapering therefrom toward appreciably more narrow nose portions at its opposite ends, including intermediately disposing transverse rib means, nose members separate from and spaced longitudinally from said transverse rib means, and a framework of individual connector elements extending between and interconnecting said rib means and said nose members, characterized by said rib means including at least one rib device having plug-like protuberances defining an arrangement of attachment locations for said connector elements which conforms, approximately, to the transverse outline of the hull at a mid section thereof, said connector elements which connect to said rib means being tubular to provide for their slip fit to said protuberances, each of said nose members being hollow and presenting in a rear face thereof a plurality of closely grouped openings, and an end of each said connector element which connects to a nose member having in connection therewith an adapter portion of barb-like configuration the form of which facilitates its penetration of one of said openings while resisting withdrawal therefrom, said adapter portions of barb-like configuration being relatively loosely received in said openings to provide for free pivotal movement thereof with respect to the related one of said nose members and tight fitting cover means in containing relation to the assembly comprising said rib means, said nose members and said connectors in an assembled relation thereof.

3,869,744

DEVICE WITH ATTACHED GRAB LINE

Donald Stuart MacMillan, and Leonard Churchward, both of Burlington, Ontario, Canada, assignors to Polyurcon Limited, Burlington, Ontario, Canada

Filed Sept. 24, 1973, Ser. No. 400,466
Int. Cl. B63c *9/08*
U.S. Cl. 9—340 **8 Claims**



1. A device with an attached grab line comprising: a body having formed therein at least one line-retaining recess opening to a surface of the body;

the recess having side walls and a bottom wall provided by the body;

at least two passages passing through the body and opening into the recess;

the grab line passing through one of the passages from outside the body to the interior of the recess and through

the other passage from the interior of the recess to the exterior of the body;

the line frictionally engaging two opposite side recess walls between which it extends from one passage to the other; at least one of the said opposite side walls frictionally engaged by the line being ridged transversely of the direction in which the line extends in engagement therewith to increase the friction between the line and the engaged sidewalls and thereby prevent longitudinal movement of the part of the line in the recess.

3,869,745

METHOD AND APPARATUS FOR MANUFACTURING SHOES

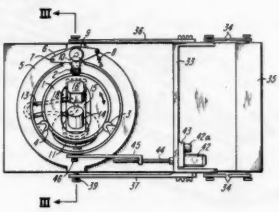
Dieter Braun, Stuttgart, Germany, assignor to Fortuna-Werke Maschinenfabrik Aktiengesellschaft, Stuttgart-Bad Cannstatt, Germany

Filed Apr. 9, 1974, Ser. No. 459,333

Claims priority, application Germany, Apr. 11, 1973, 2318206

Int. Cl. A43d *21/00*

U.S. Cl. 12—145 **21 Claims**



1. The method of folding the upper of a shoe over the sole which comprises; supporting the shoe with the sole exposed, supporting a cup shaped tool on a central axis of rotation which is inclined to said sole with the open side of the tool facing the sole and with a region of the rim of the tool engaging the sole near the periphery thereof, rotating the tool on its central axis to wipe the edge of the upper toward the center of the shoe sole, moving the tool and the shoe relatively to cause the region of the tool engaging the sole to follow a closed path about the sole to wipe the edge of the shoe upper over the entire periphery of the shoe sole, said closed path being formed by rotating said tool bodily about an axis perpendicular to the sole in about the center thereof at each end of the sole, and moving the tool bodily in a straight line along each side of the sole, a line drawn from the point of intersection of said axis with the plane of the sole to said region of the rim of the tool which engages the sole being substantially tangential to said path in each relative position of said tool and shoe.

3,869,746

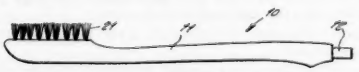
HYDRAULIC TOOTHBRUSH

Law Man-king 339-341 Lackhart Rd., 20/F. Wanchai, Hong Kong

Filed Oct. 9, 1973, Ser. No. 404,654

Int. Cl. A46b *13/06*

U.S. Cl. 15—29 **8 Claims**



1. A power toothbrush comprising a head and a handle, means forming a water flow channel in said head, a plurality of brush units, each brush unit including a platform and bristle tufts, said bristle tufts being secured to said platform and projecting from said head, means rotatably mounting each brush unit to said head, impeller means, means fixing the impeller means to the brush unit for unitary rotation therewith, the impeller means being positioned in said water flow channel, the head further including means in communication with the channel for connection to a supply of water under pressure and means for discharging water from the channel whereby water flow through the channel will impinge upon each impeller means causing the brush units to rotate, thereby providing movement of the tooth cleansing bristles.

3,869,747

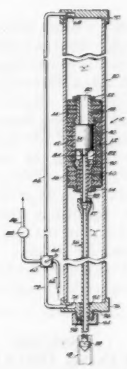
MOTOR PISTON TUBE CLEANER

Harold L. Richter, 7950 Hawthorne Ave., Miami Beach, Fla. 33141

Filed June 25, 1973, Ser. No. 372,968

Int. Cl. B08b *9/02*

U.S. Cl. 15—104.1 R **10 Claims**



1. A device for driving a tool carrying drill shaft for drilling elongated holes or for drilling, cleaning or brushing the interiors of tubes of the nature contained in heat exchangers, coolers, condensers, etc., comprising:

A. an elongated barrel defining a column having a first end and a second end and including,

1. first and second end caps, said barrel having a port adjacent each of the opposite ends, said second end cap having an opening;

B. a piston for reciprocating movement in said barrel between the end caps including,

1. motor means fixed within said piston, and means to supply drive fluid to the motor means and to provide exit means for the drive fluid including port means extending in fluid communication through said piston and means exteriorly of the barrel to provide fluid communication means between the ports adjacent the opposite ends;

C. a drill shaft rotatably attached to a rotor shaft extending outwardly from said motor, said drill shaft extending through the opening of said second end cap for the detachable reception of a tool on its extended end, outwardly of said second end cap;

D. a fluid power means;

E. conduit means;

F. four-way valve means connected in said conduit means for selectively directing said fluid power means through said ports adjacent each of the opposite ends into corresponding end portions of said barrel to cause reciprocating movement of said motor carrying piston within said

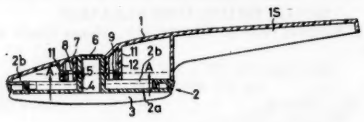
barrel and to simultaneously energize said motor to cause rotary movement of said tool carrying drill shaft.

3,869,748

BRUSH WITH ROTATABLE BRUSH PLATE

Kurt Krusche, Nansenring 22, D-6000 Frankfurt/Main, Germany

Filed Dec. 26, 1973, Ser. No. 427,528
Claims priority, application Germany, Dec. 28, 1972, 2263741
Int. Cl. A46b 9/02, 9/10
U.S. Cl. 15—172 **10 Claims**



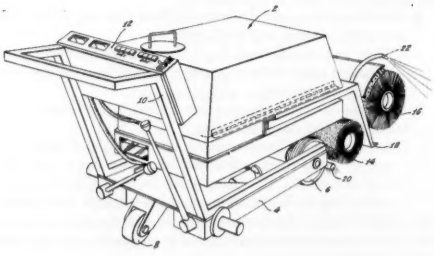
1. A brush comprising a brush plate rotatably arranged on a brush back and in which these two brush parts are connected with each other by members which project from the brush plate and the brush back and interengage in the interior of the brush so as to allow relative rotation of the said members through 360°, the said members having co-operating detent formations which maintain the said members in their interengaged relation while allowing the relative rotation, a ring surrounding one of the said members at a spacing being provided on the side of the brush plate remote from its brushing surface, diametrically oppositely disposed axial ribs being arranged on the outer wall of the ring, which engage in axial grooves which are formed in a sleeve which extends from the inner side of the brush back and which surrounds the ring, said ribs and grooves acting as detent means.

3,869,749

CLEANING APPARATUS

Arnold B. London, Beverly Hills, and Jiri Nessel, Palo Alto, both of Calif., assignors to Arnold B. London, Beverly Hills, Calif., by said Jiri Nessel

Filed June 12, 1972, Ser. No. 262,110
Int. Cl. A47l 5/38
U.S. Cl. 15—302 **32 Claims**



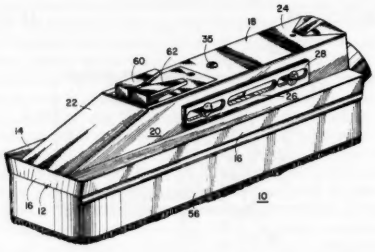
1. An escalator cleaning apparatus comprising
a carriage;
means to fixedly position said carriage between a pair of escalator sidewalls;
wheels mounted on the underside of said carriage;
a reciprocable first frame positioned on said carriage for reciprocation in a transverse direction;
first brush means carried by said reciprocable first frame;
a reciprocable second frame positioned with respect to said carriage for reciprocation in a longitudinal direction;
second brush means carried by said second frame; and
said second frame extending forwardly of said first frame, whereby said first brush means is reciprocated in a transverse direction to an escalator step surface and said second brush means is reciprocated in a longitudinal direction to an escalator step surface.

3,869,750

WALL BRUSH

Seymour Dudley Wallick, Clifton, and Joseph Jacob Sandler, Wayne, both of N.J., assignors to Wis-King, Inc., Fairfield, N.J.

Filed Aug. 21, 1973, Ser. No. 390,314
Int. Cl. A47l 7/00, 9/06
U.S. Cl. 15—322 **8 Claims**

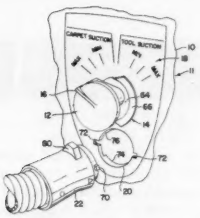


1. A brush comprising
a housing including a planar surface provided with depending side walls;
a cover plate secured to one of said depending side walls to establish a chamber within said housing, said cover plate having suction openings therethrough;
an access opening to said chamber through which a vacuum may be applied thereto;
valve means positioned in said chamber and operable from a location outside of said chamber for selectively dispensing fluid conveyed to said valve means;
supply conduit means secured at one end thereof to said valve means and passing at an opposite end thereof out of said chamber, whereby a source of fluid may be attached thereto;
dispensing conduit means secured at one end thereof to said valve means, said dispensing conduit means passing out of said chamber and including a dispensing portion having exit openings therein through which fluid may be dispensed; (and)
a brush sub-assembly removably secured with respect to said cover plate, said brush sub-assembly including passageways therethrough which communicate with said suction openings in said cover plate;
whereby fluid dispensed through said exit openings may be withdrawn through said passageways;
wherein said cover plate is hinged to said housing at one end thereof; and
wherein said dispensing conduit means includes an intermediate portion generally transverse to said dispensing portion, and the opposite end of said cover plate includes positioning means for establishing a pivoting fulcrum position for said intermediate portion of said dispensing conduit means.

3,869,751
INTERLOCKED CONVERSION FOR A CONVERTIBLE CLEANER

Wilton E. Boyd, and David B. Rennecker, both of Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Nov. 16, 1973, Ser. No. 416,345
Int. Cl. A47l *9/00*
U.S. Cl. 15—334 **10 Claims**

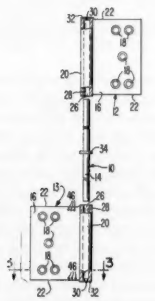


1. An interlock means for a convertible cleaner including;
a. a conversion valve for providing a carpet suction mode and a tool suction mode,
b. a manually actuatable means for actuating said conversion valve,
c. a hose coupling connectable to said convertible cleaner, and
d. blocking means movable with said manually actuatable means for blocking disconnection of said hose coupling.

3,869,752
HINGE ASSEMBLY

William F. Klay, Palo Alto, Calif., assignor to Dale M. Waltz, Los Altos Hills, Calif., a part interest

Filed Nov. 6, 1972, Ser. No. 304,293
Int. Cl. E05d *9/00*
U.S. Cl. 16—128 **10 Claims**

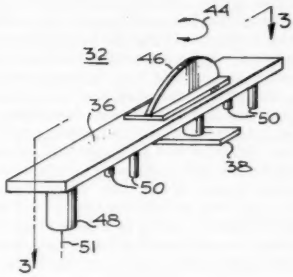


1. A hinge assembly comprising: a pair of substantially identical hinge units, each unit including a plate having a number of screw-receiving holes therethrough and a generally cylindrical, imperforate, pin-receiving knuckle integral with and extending along the entire length of one side margin of the plate, each plate having a pair of opposed end marginal edges extending transversely of the corresponding knuckle, the ends of each knuckle projecting outwardly from adjacent end marginal edges of the corresponding plate; and a hinge pin loosely receivable in said knuckles for pivotally interconnecting the hinge units with the knuckles in aligned, end-to-end relationship, each knuckle having an open, first end permitting the hinge pin to be inserted into and extend through a major portion of the knuckle, the opposite end of each knuckle having projection means for blocking the movement of the hinge pin out of the knuckle past said opposite end, the hinge units adapted to be mounted in operative positions with the knuckles in aligned, end-to-end relationship to each other and with said first ends of the knuckles in proximity to each other, whereby the plates of said hinge units can be spaced from and coplanar with each other as they project in the same direction from the hinge pin so as to avoid engagement of the plates with each other and the need to mortise the structures to which the hinge units are to be attached.

3,869,753
REMOVABLE HINGE ARRANGEMENT

John G. Boback, P.O. Box 1227, Hawthorne, Calif. 90250

Filed May 21, 1973, Ser. No. 362,017
Int. Cl. E05d *1/06*
U.S. Cl. 16—171 **9 Claims**



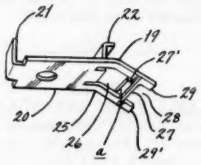
1. A removable hinge arrangement for structures having front, back, side, top and bottom walls defining a storage cavity, the front wall having edge portions defining an aperture therethrough providing communication to the cavity, the walls having a rigid outer skin with a plurality of tab accepting apertures therethrough, in a predetermined array, and door means hingedly coupled adjacent the front wall for closing the aperture, and comprising, in combination:
a top hinge means removably coupled to the structure adjacent the intersection of the top wall and front wall thereof and comprising:
a top plate member adjacent the outer surface of the rigid skin;
a top hinge pin coupled to said top plate member and spaced a first preselected distance from the first wall, said top hinge pin extendable vertically downwardly into the door and alignable therein on a first axis; and
a top tab member coupled to said top plate member and removably extendable into first of the plurality of tab accepting apertures in the skin, and said tab member having an insertion position allowing insertion and removal of said tab member into and from the aperture in the skin, and having a clamping position providing a frictional engagement with the skin and having a predetermined frictional force clamping the skin between said top tab member and said top plate member;
a bottom hinge means coupled to the structure in regions adjacent the intersection of the front wall and the bottom wall thereof and having a bottom hinge pin extendable vertically upwardly into the door, and said bottom hinge pin spaced said first preselected distance from the front wall and alignable coaxially along said first axis with said top hinge pin,
whereby the door is pivotally movable on and supported by said top and bottom hinge pins.

3,869,754

BRACKET FOR A SPRING SASH COUNTERBALANCE

Edwin E. Foster, 1801 Camp Craft Rd., Austin, Tex. 78767

Division of Ser. No. 283,400, Aug. 24, 1972, Pat. No. 3,820,193. This application Sept. 10, 1973, Ser. No. 395,903
Int. Cl. E05d *13/10*
U.S. Cl. 16—197 2 Claims



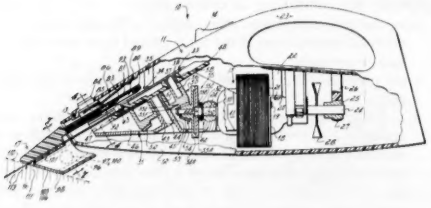
1. A support member comprising a unitary body of elongate character having first and second end portions, said body having a flat mounting portion adjacent said first end portion for disposition against a mounting surface and extending from said first end portion to a point spaced from said second end portion, said body between said flat mounting portion and said second end portion being planarwise angulated with respect to said mounting portion, said body further having an opening extending transversely thereof adjacent said mounting portion remote from said first end portion, there being an endwise opening recess proximate the said opening and forming the second end portion of said body, the said opening, the said recess, and the said second end portion being contained within said angulated portion of said body, a tongue provided at the extremity of said first end portion, and a hook member provided between said mounting portion and said opening, the major planes of said tongue and said hook members being normal to the planes of said mounting portion.

3,869,755

METHOD AND APPARATUS FOR TENDERIZING MEAT

Daniel B. Stauft, 5494 Galbraith Rd., Cincinnati, Ohio 45236

Continuation-in-part of Ser. No. 303,861, Nov. 6, 1972, abandoned. This application May 23, 1974, Ser. No. 472,697
Int. Cl. A22b *5/08*
U.S. Cl. 17—25 45 Claims



1. Portable apparatus for tenderizing meat comprising,
a housing having a handle,
said housing further having a foot,
said foot having a bottom surface engageable with a surface of the meat to be tenderized,
a motor within said housing,
a knife blade slidably mounted in said housing, said blade having a cutting end projectable from said bottom surface of said foot, said blade being angulated relative to said bottom surface of said foot so that said cutting end of said blade penetrates said surface of the meat at an angle of between approximately 15° to 60° to a vertical plane normal to said surface of the meat as said bottom surface of said foot is moved over said surface of the meat, and means connecting said motor to said knife blade for reciprocation of said knife blade.

3,869,756

SHIRRED CASING STICK WITH REVERSE HELICAL FOLD PATTERN

Valdis M. Tums, Palos Park, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 159,858, July 16, 1971, Pat. No. 3,779,284. This application May 25, 1973, Ser. No. 364,137
Int. Cl. A22c *13/00*
U.S. Cl. 17—49 3 Claims

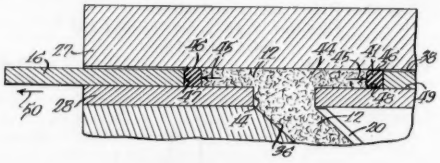
1. In a method for producing shirred cohesive sticks of sausage casing which comprises the step of shirring inflated casing on a mandrel against a holdback to pleat and compress the casing; the improvement which comprises rotating said casing axially about said mandrel in a clockwise direction; reversing the rotation of said casing about said mandrel to counter clockwise rotation; and continuing repetitive cycles of clockwise and counter clockwise rotation of said casing during shirring thereof to provide a shirred, coherent stick of desired length.

3,869,757

MOLDING APPARATUS WITH VALVED AIR RELEASE

Harry H. Holly, Olympia Fields, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Jan. 24, 1974, Ser. No. 436,192
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 8 Claims



1. Mold apparatus for molding a pressurized plastic material, comprising: means defining a mold opening for receiving an opening-filling charge of said pressurized material; means defining an escape passage for venting gases from the mold opening during filling of said opening with said material; and a pressure responsive elastic solid valve member at the mold opening having a first surface portion defining a part of said mold opening and a substantially unconfined second portion defining a part of said escape passage, pressure of said pressurized plastic material in the mold opening on said first surface portion thereby projecting a pressure distorted portion of said second portion of the solid elastic member across and blocking said escape passage upon substantially complete filling of said mold opening with said material.

3,869,758

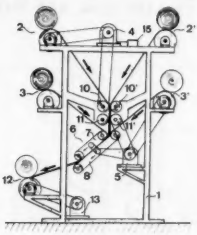
APPARATUS FOR MANUFACTURING COMPOSITE ROVINGS

Gabriel T. Lautier, Mas de Bonnet, (81) Labastide-Rouairoux, France

Filed Sept. 14, 1972, Ser. No. 289,075
Claims priority, application France, Sept. 14, 1971, 71.33039
Int. Cl. D01g *15/58*
U.S. Cl. 19—153 2 Claims

1. An apparatus for making composite rovings having a plurality of fibres differing from each other in nature, colour

and size, comprising: at least one friction-sleeve means including a pair of sleeves bearing against each other, said sleeves each having semi-rigid runs and being rotatable in opposite directions; first drive means imparting a continuous rotary motion to said sleeves and second drive means imparting a lateral reciprocating motion to said sleeves whereby said sleeves are imparted with a dual rotary and lateral reciprocating motion; first feed means actuated by driving means in synchronism with the rotary motion of said sleeves for continuously feeding at least a first roving to said friction-sleeve



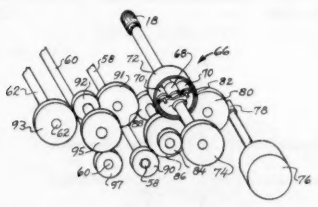
means; second feed means for intermittently feeding at least a second roving to said friction-sleeve means through at least two pairs of pressure rolls arranged at the inlet of said friction-sleeve means; the pressure rolls of a first pair being pressed together and driven intermittently by further driving means; the pressure rolls of the other pair, located downstream of said first pair, being pressed together and being driven in synchronism with the rotary motion of the sleeves of said friction-sleeve means; and means for winding composite rovings delivered at the outlet of said friction-sleeve means.

3,869,759

DRIVE MEANS FOR TEXTILE SLIVER DRAFTING ASSEMBLY

Richard J. Savageau, Seneca, and Gordon C. Anderson, Clemson, both of S.C., assignors to Saco-Lowell Corporation, Greenville, S.C.

Filed Oct. 24, 1973, Ser. No. 409,217
Int. Cl. D01h *5/32*
U.S. Cl. 19—293 **8 Claims**



1. In combination with a two-delivery textile drawing machine having first and second sliver drafting assemblies each including a driven front bottom roll and a plurality of additional bottom rolls mounted rearwardly of the parallel to said front roll for independent adjustment toward and away from each other and said front roll to vary the spacing therebetween, first and second drive means respectively associated with said first and second drafting assemblies and each interconnecting said front roll and said rearward rolls of the associated one of said assemblies for driving said rearward rolls of said assembly at desired speeds in any adjustive position of said rolls, each said drive means comprising:

a plurality of axially-fixed countershafts corresponding in number to an underlying said rearward rolls of the associated one of said drafting assemblies and extending in spaced and generally parallel relationship to associated ones of said rearward rolls;

gearing means disposed adjacent one side of said one assembly and drivingly interconnecting said front roll thereof and said countershafts, said gearing means including a plurality of sets of change gears all rotatable about fixed axes, one of said sets being adapted to control the speed of all said rearward rolls of said assembly, another of said sets being adapted to control the speed of only one of said rearward rolls of said assembly, and still another of said sets being adapted to control the speed of only another one of said rearward rolls of said assembly;

flexible timing belt drive means disposed adjacent the other side of said drafting assembly and drivably interconnecting respective ones of said countershafts and said rearward rolls, said timing belt means including a plurality of timing belts corresponding in number to said rearward rolls of said assembly and each interconnecting one of said rearward rolls and an associated one of said countershafts;

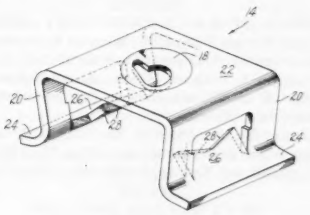
and a plurality of tension compensating assemblies corresponding in number to and each operatively associated with one of said timing belts, each of said tension compensating assemblies including a swing arm pivotally mounted adjacent one end thereof, an idler pulley mounted adjacent the other end of said arm for pivotal movement therewith, and spring means adjacent said one end of said arm biasing said arm in a direction urging said idler pulley into tensioning engagement with the associated one of said timing belts.

3,869,760

RETAINING CLIP FORMED FROM SHEET MATERIAL

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation of Flemington, New Jersey, Boston, Mass.

Filed Sept. 20, 1973, Ser. No. 399,463
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 **3 Claims**

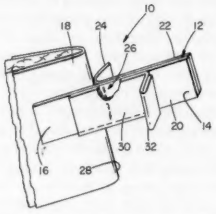


1. A one-piece push-on type fastener formed from sheet material for securing a workpiece in assembled relation to a protuberant work support and comprising a substantially U-shaped clip received over the work support, the clip including at least one pair of resilient legs extending from an integral leg-spanning portion, the free ends of said legs being spring biased toward each other and spreadable apart by engagement with opposed portions of the protuberant work support, said legs respectively having an intermediate portion formed with a tang struck inwardly therefrom to project toward the leg-spanning portion for cooperative gripping engagement with said opposed portions of the work support, the gripping edge of at least one of said tangs being of transversely recessed V-notch shape, and said work-spanning portion being formed with means for securing the workpiece thereto, the arrangement being such that relative withdrawal of the assembled clip and/or the workpiece from the work support urges the tangs toward a straighter toggle relationship and hence tighter gripping of the support.

3,869,761
DISPOSABLE DIAPER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,692
Int. Cl. A44b *21/00*; B32b *3/10*
U.S. Cl. 24—73 VA 9 Claims



1. A tape unit for a diaper comprising,

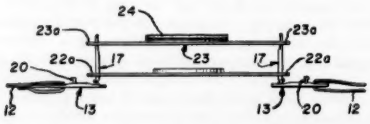
a primary tape strip having a first surface coated with an adhesive and a second surface, said first and second surfaces being on opposite sides of said primary tape strip, said first surface having a first portion secured to a first diaper portion and a second portion securable to a second diaper portion for securing the diaper on an infant, said primary tape strip having a region of reduced strength intermediate the first and second tape portions; and

a reinforcing strip removably secured to said primary strip second surface and at least partially covering said region of reduced strength, said reinforcing strip thereby preventing disengagement of the first and second strip portions until removed from the region of reduced strength, a release sheet removably secured to said second portion on said primary strip first surface whereby separation of said release sheet and said primary strip second portion permits said second portion to be attached to said second diaper portion.

3,869,762
FASTENING APPARATUS FOR OSTOMY APPLIANCES

Donald Dean Barrett, Palos Hills; Kenneth R. Whalen, Worth; Charles Nichols, Arlington Heights; Robert G. Knapp, Wheaton; Jay A. Wickum, Westmont, and Daniel A. Maust, Winfield, all of Ill., assignors to Marsan Manufacturing Company, Inc., Wausau, Wis.

Division of Ser. No. 307,936, Nov. 20, 1972, Pat. No. 3,789,846, which is a continuation of Ser. No. 105,286, Jan. 11, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,925
Int. Cl. A61f *5/44*; A44b *21/00*
U.S. Cl. 24—81 AG 5 Claims



1. Apparatus for releasably securing, in substantially superimposed relation, a pair of objects each having at least two laterally opposed openings spaced apart the same distance on each object, said apparatus comprising:

means mounting said two objects in superimposed relation;

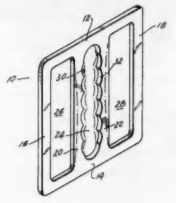
at least two fastening means, each for releasably securing said two objects through and about one of said openings in each object when the objects are in superimposed relation, each of said fastening means including means cooperative with the corresponding means of the other for retaining one of said objects in a secured position during release, removal and replacement of the other object; and,

belt means interconnecting said fastening means.

3,869,763
BUCKLE-STRAP CONSTRUCTION

Herman W. Senk, Brookville, and Bernard S. Resnik, Melville, both of N.Y., assignors to Lehigh Industries, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 333,014, Feb. 16, 1973, abandoned. This application July 5, 1973, Ser. No. 376,351
Int. Cl. A44b *11/04*; A44c *5/18*
U.S. Cl. 24—198 6 Claims

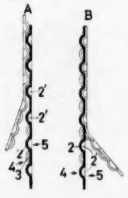


1. A buckle and strap assembly comprising a buckle formed of essentially non-resilient deformable material and having a pair of elongated side pieces, a pair of cross pieces joining said side pieces intermediate their ends and having inner edges defining a strap slot therebetween, and a strap inserted through said strap slot, said cross pieces being bent inwardly toward one another thereby to engage and firmly secure said strap, at least one of said cross pieces having a non-engaging outer edge defining a continuous and substantially linear surface throughout its major portion and including adjacent each end thereof a notch in a substantially collapsed condition.

3,869,764
PRESS-ON AND SPLIT-OFF TYPE FASTENER AND MANUFACTURING DEVICE THEREFOR

Hideo Umezu, Tokyo, Japan, assignor to International Fastener Establishment, Vaduz, Liechtenstein

Continuation of Ser. No. 230,254, Feb. 29, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,769
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 11 Claims



1. A press-on, separable fastener comprising:

first and second facing portions, each of said portions having a support member, and a set of adjoining longitudinal parallel strips on said support member, each of said strips providing a series of spaced apart ridges protruding from said support member, each of said strips containing a series of spaces, each of said spaces being two successive ones of said ridges,

within each of said portions, adjoining ones of said strips being longitudinally staggered relative to each other such that said ridges and spaces of adjoining strips are alternately juxtaposed,

the edges of said ridges of said first portion frictionally engaging the edges of said ridges of said second portion when said portions are engaged.

3,869,765

BRIDGE TOP STOP FOR SLIDE FASTENERS

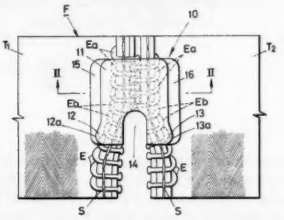
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed , Ser. No. 476,730

Claims priority, application Japan, June 25, 1973, 48-72114

Int. Cl. A44b *19/36*

U.S. Cl. 24—205.11 F **3 Claims**



1. In a slide fastener comprising a pair of stringer tapes, a row of interlocking fastener elements secured to and along one longitudinal edge of each of said stringer tapes and a slider movable along said longitudinal edge to couple and uncouple the rows of fastener elements, the improvement which comprises a bridge top stop positioned at an upper end of the fastener and adapted to prevent the slider from running off said upper end, said bridge top stop embracingly overlying a first length of fastener elements that remain coupled at said upper end and a second length of fastener elements that continue from said first length but are uncoupled, and said bridge top stop being bonded integrally with said first and second lengths of fastener elements to the stringer tapes.

3,869,766

PLASTIC SNAP FASTENER

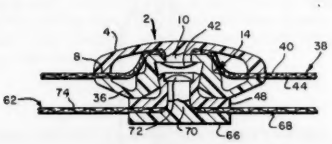
Alain Raymond, Seyssinet Pariset, France, assignor to A. Raymond, Lorrach, Baden, Germany

Filed Dec. 21, 1972, Ser. No. 317,457

Claims priority, application Germany, Dec. 22, 1971, 2163686

Int. Cl. A44b *17/00*

U.S. Cl. 24—216 **10 Claims**



1. A socket component for a separable snap fastener comprising a body of firm but yielding tenacious and resiliently distensible polymeric material in the form of a solid of revolution and including a central portion defining a stud receiving cavity, said cavity having a peripheral wall circumscribing the central axis of said socket and the roof of said cavity being disposed adjacent the upper end of said central portion of said socket, and an integral, cup-shaped peripheral flange joined to said central portion adjacent the lower end thereof and relatively proximate the entrance to said cavity and extending radially outwardly and upwardly at an acute angle relative to the central axis of the socket from its junction with said central portion and terminating in an upper planar surface which engages a support element to which the socket is attached at points substantially radially spaced from said central portion to stabilize said socket relative to the support element, said upper planar surface being located in a plane lying substantially transverse the central axis of said socket and intersecting said axis at an imaginary point disposed substantially upwardly of the entrance to said cavity, the material thickness of said flange adjacent its junction with said central portion being substantially less than the material thickness of said central portion for substantially the full depth of said cavity, said flange defining, adjacent said junction, a resilient hinging web about which said central portion of said socket distends and resiles responsive to the insertion of a cooperating snap fastener stud component into said cavity.

3,869,767

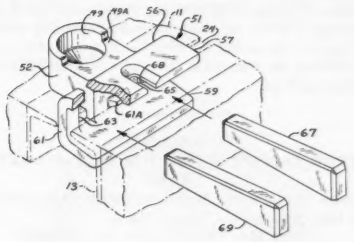
METHOD OF REFORMING AND STRAIGHTENING MEMBERS

Wayne E. Hunnicutt, Big Bend, and Peter G. Rossbach, Waukesha, both of Wis., assignors to Applied Power Industries, Inc., Milwaukee, Wis.

Division of Ser. No. 135,274, April 19, 1971, Pat. No. 3,754,427. This application Apr. 23, 1973, Ser. No. 353,563

Int. Cl. A44b *21/00*

U.S. Cl. 24—243 CC **2 Claims**



1. A clamp assembly comprising in combination a body section defining a socket therein for receiving a ball bearing; a C-shaped section comprising spaced flanges separated by a bight portion, there being apertures in said bight portion for receiving wedges therein; and,

said clamp assembly being mountable, in a slotted surface wherein said surface is undercut to form extending lips, by inserting one of said flanges in said slot and beneath said lip, and inserting said wedges in said apertures to wedge against said surface and said other flange.

3,869,768

METHODS OF COMPRESSIVELY TREATING FLEXIBLE SHEET MATERIALS

Richard Rhodes Walton, Ten W. Hill Pl., Boston, and George Ernest Munchbach, Roslindale, both of Mass., assignors to said Walton by said Munchbach

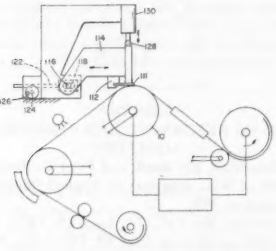
Continuation-in-part of Ser. No. 115,606, Feb. 16, 1971, Pat. No. 3,810,280. This application Feb. 7, 1973, Ser. No. 330,176

Int. Cl. D06c *21/00*

U.S. Cl. 26—18.6 **2 Claims**

1. In a process of establishing a continuous longitudinal compressive treatment of a running length of flexible material comprising pressing the material with a confining surface against a moving drive surface and beyond said confining surface and on the same side of the material engaging the material with a retarding surface, the improvement comprising initially positioning the confining surface in material-driving position while maintaining the retarding surface in an ineffective position, subsequently relatively moving a pressing means generally along the drive surface with respect to said confining and retarding surfaces to position the retarding

surface closer to the drive surface to progressively increase the retarding effect, while doing the latter, continuing the pressing of the confining surface so that there occurs at all times travel of the material without slippage relative to the drive surface up to a point O beneath the confining surface, close to but spaced in advance of the beginning point M of



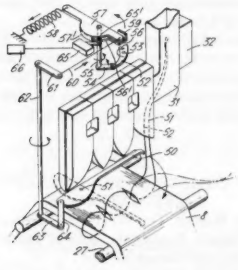
said retarding surface, at which point O slippage of the material relative to said drive surface commences, and then while continuing to press the confining surface, bodily shifting the latter rearwardly against the direction of travel of the material, and retarding the material in the region vacated by said shifted confining surface.

3,869,769

METHOD AND APPARATUS FOR LACING A SKEIN OF YARN

Naoichiro Tanno, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Nakagyo-ku, Kyoto, Japan

Filed May 23, 1974, Ser. No. 473,090
Int. Cl. B65h *54/62*
U.S. Cl. 28—21 **19 Claims**



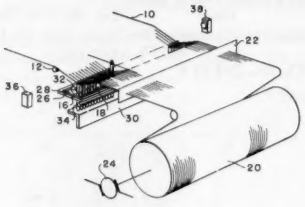
1. A method of lacing a skein of yarn, comprising: dividing the width of said skein into a plurality of section is at least one circumferential portion of said skein; forming a pair of air passages which extend serpentine with respect to each said section from one side of said skein transversely to the opposite side thereof, crossing each other between each adjacent two of said sections without interfering with each other; producing a pressure difference between the opposite sides of said passages; and supplying a length of lacing string to said passages so that said string is passed through said passages thereby lacing said skein.

3,869,770

TIGHT WARP DETECTOR

Robert W. McCullough, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 10, 1973, Ser. No. 387,492
Int. Cl. D02h *13/08*
U.S. Cl. 28—51 **1 Claim**



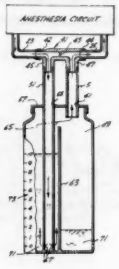
1. A stop motion for a warp yarn take-up machine and warp beam, the rotation of which advances a plurality of yarn ends comprising: a light source, a photocell spaced from said light source, a plurality of drop wires located between said light source and said photocell operably associated with said yarn end, limiting means located under said drop wires to limit the downward movement thereof, the weight of said drop wires being greater than the desired tension in said yarn causing the drop wires to contact said limiting means, drive means driving said warp beam and control means operably associated with said photocell and said drive means to cut off said drive means when the tension of any of the yarn ends exceeds the desired valve and raises its associated drop wire between said light source and said photocell.

3,869,771

DEVICE FOR REGULATING POSITIVE END EXPIRATORY PRESSURE

Charles W. Bollinger, 10531 Nottingham Rd., Edmonds, Wash. 98020

Filed Oct. 17, 1973, Ser. No. 407,140
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **8 Claims**



1. A device for regulating positive end expiratory pressure comprising:

an enclosed container divided into two chambers by a wall, said wall allowing a liquid housed in said container to be moved between said two chambers when said container is tilted in a predetermined manner from a normal upright position;

a liquid housed in said chambers of said container;

a first tube extending into one of said chambers, said first tube being attached to the bottom of said one of said chambers and including apertures located adjacent the end attached to the bottom of one of said chambers, said

apertures communicating between the interior of said first tube and the interior of said one of said chambers; and,

a second tube extending into said container so as to have one end terminate above said liquid in said chambers.

3,869,772

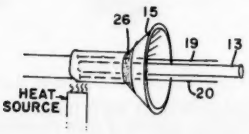
METHOD OF INCORPORATING AMALGAM-FORMING MATERIAL IN A FLUORESCENT LAMP

Frank M. Latassa, Magnolia; Howard W. Milke, Danvers, and Tadius T. Sadoski, Salem, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 25, 1974, Ser. No. 463,952

Int. Cl. H01j *9/18, 17/26*

U.S. Cl. 29—25.13 **9 Claims**



1. In the manufacture of a low-pressure mercury vapor discharge lamp having an electrode mount structure including a vitreous stem sealed to and extending inwardly from one end of the lamp envelope, the method of incorporating an amalgam-forming material as an integral part of the lamp and at a location therein such that said material will regulate the mercury vapor pressure when the lamp is operated, said method comprising:

heating a vitreous tube from which said stem is to be made to the softening point thereof,

flaring said heated stem tube at one end,

applying said amalgam-forming material onto the exterior surface of the flared portion of said heated stem tube,

inserting an exhaust tube and lead wires into said stem tube, heating the non-flared end of said stem tube to the melting point thereof,

pressing the non-flared end of said heated stem tube to fuse said exhaust tube and lead wires therein,

completing fabrication of the electrode mount structure which includes said stem tube, exhaust tube and lead wires, and

attaching said mount structure to the lamp by sealing the periphery of the flared portion of said stem tube to an end of said lamp envelope, and then completing the fabrication of the lamp.

3,869,773

ABRASION DISK FOR SOAP DISPENSERS

Albert Gneiding, Friedrichshafen, Germany, assignor to Belras AG, Rorschach, Switzerland

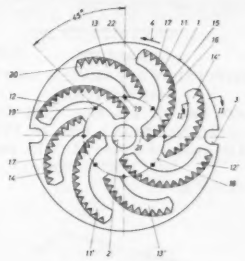
Filed May 31, 1973, Ser. No. 365,482

Claims priority, application Germany, June 13, 1972, 2228633

Int. Cl. B23d *71/00*

U.S. Cl. 29—78 **11 Claims**

1. A rotatable rasp disk for use in connection with a soap dispenser which operates with bars of soap comprising: a disk having projecting teeth thereon, the teeth provided along longitudinal edges of a plurality of arcuately curved recesses through the disk, the recesses comprising slots, said slots being curved in a radial direction and formed as segments of a circle having their centers circumferentially ahead of the slots in the direction of rotation of the disk, the slots having opposed end portions curving away from an intermediate portion in the direction of rotation, the teeth provided by the material of the



disk projecting upwardly therefrom at an angle to the plane of the disk in the direction of rotation.

3,869,774

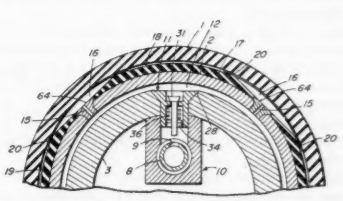
FLUID BEARING TABLE ROLL

James O. Gallant, Rehoboth; Robert E. Staples, Lakeville, and George P. Knapp, Waban, all of Mass., assignors to Mount Hope Machine Company, Incorporated, Taunton, Mass.

Filed Jan. 28, 1974, Ser. No. 436,884

Int. Cl. B21b *13/02*

U.S. Cl. 29—116 AD **15 Claims**



1. A roll for supporting a travelling element, comprising in combination:

a stationary axle having a rectilinear longitudinal axis;

an annular shell of circular cross-section received about said axle;

a series of fluid bearing elements received in axially-spaced relation along said axle and rotatably mounting said shell thereon;

means mounting said bearing elements on said axle for adjustment transversely to said longitudinal axis thereof to permit alignment of rotational axes of said shell about each of said bearing elements;

peripheral portions of said bearing elements being formed of elastomeric material and being formed with orifices communicating with the interior of said shell for delivering lubricating fluid thereto, said peripheral portions surrounding said orifices and having substantially the same radius as the interior surface of said shell, the remainder of the peripheries of said bearing elements being reduced to a smaller radius;

and supply means for delivering a flow of lubricating fluid under pressure through said bearing elements to said orifices, said supply means comprising conduit means communicating with said orifices and at least one valve means interposed in said conduit means;

said valve means including a valve member, means biasing said valve member to a closed position against a normal pressure of the supply of fluid, and a channel by-passing a normal rate of flow of fluid to said orifices around said valve member when the latter is in a closed position, said

valve means being constructed and arranged to open under a pressure of the fluid greater than said normal pressure to increase the rate of flow of the fluid to said orifices above said normal rate.

3,869,775

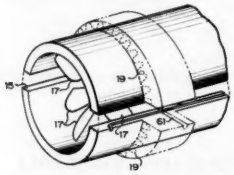
LIQUID PROPULSION APPARATUS AND METHOD OF FABRICATION

Albert C. Smith, Box 782, Los Altos, Calif. 94022

Division of Ser. No. 184,462, Sept. 28, 1971, Pat. No. 3,785,327. This application July 12, 1973, Ser. No. 378,641

Int. Cl. B21k *3/00*

U.S. Cl. 29—156.8 R **3 Claims**



1. The method of forming a rotatable impeller-output shaft for operative coupling to a movable element within an expandable combustion chamber of an internal combustion engine, the method comprising the steps, performed in selected sequence, of:

forming at least a pair of partial substantially cylindrical sections having mating faces oriented longitudinally along a portion of the length of the shaft, each partial cylindrical section having walls which define a generally cylindrical internal bore through said shaft;

forming at least one operative coupling element on the outside surface of the wall of at least one of said shaft sections;

forming a plurality of radially-intruding liquid impeller vanes on the internal walls of at least one of said shaft sections;

forming bearing surfaces at least on the outside walls of said shaft near the ends thereof;

forming a recessed groove in the mating face of at least one of said shaft sections to communicate with the outside wall of said shaft at least at one of the bearing surfaces thereon and with an outside surface on said operative coupling element; and

attaching said shaft sections together including sealing said recessed groove from the internal and outside surfaces of said walls to form in addition to said internal bore a fluid conduit which communicates at least with a bearing surface near an end of said shaft and with an outside surface of said operative coupling element.

3,869,776

METHOD OF FABRICATING CURVED FITTINGS AND DEVICE FOR EFFECTING SAME

Evgeny Nikolaevich Moshnin, ulitsa Akademika Pavlova, 50, kv. 5; Nikolai Ivanovich Romashko, Moscow, Leninsky Raion, selo Molokovo, Moskovskaya oblast; Vyacheslav Pavlovich Nikolaev, Podolsk ulitsa Kirova 51-a, kv. 46, Moskovskaya oblast, and Viktor Alexeevich Odnodushny, Stremyanny pereulok, 2/12, kv. 8, Moscow, all of U.S.S.R.

Filed Aug. 16, 1973, Ser. No. 388,913

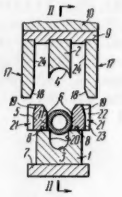
Int. Cl. B21d *7/06*

U.S. Cl. 29—157 A **13 Claims**

1. A method of fabricating a curved fitting from a tubular blank having a round cross-section through the intermediary of a first pair of dies having substantially flat working surfaces and a second pair of dies having arcuate recesses extending in longitudinal and transverse sections thereof, comprising the steps of:

a. imparting double-sided compression to said tubular blank by said first pair of dies so as to deform the round shape of the cross-section of said tubular blank into a shape having an oval cross-section;

b. positioning said deformed tubular blank in close contact between the dies forming said second pair of dies, said



dies being disposed on either side of the major axis of said oval cross-section of said blank until completion of the sequence of fabricating said curved fitting; and

c. simultaneously bowing and compressing said deformed tubular blank by closing the dies forming said second pair, and moving said dies along the major axis of the oval cross-section of said deformed blank so as to shape said blank into said curved fitting.

3,869,777

COMPONENT PARTS OF WELDED ROTORS

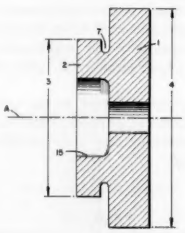
Andre Coulon, Belfort, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Paris, France

Filed Aug. 28, 1972, Ser. No. 284,111

Claims priority, application France, Aug. 27, 1971, 71.31275

Int. Cl. B22f *5/00*

U.S. Cl. 29—183 **8 Claims**

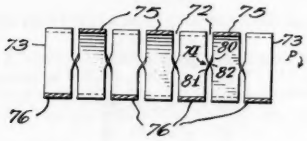


1. A component part of a welded rotor for turbines, or the like, comprising a ring or disc having a central axis and an axial extension of annular shape extending coaxially from one face thereof, which extension has an outside diameter smaller than that of said disc or ring and the outer annular surface of which is to be welded against the outer annular surface of a corresponding extension of an adjacent disc or ring, said extension having at the portion thereof connected to said disc or ring an annular groove disposed in the radially external portion of the extension and an annular fillet on the extension within the central opening thereof.

3,869,778
ARTICLE OF MANUFACTURE WITH TWISTED WEB

Raymond W. Yancey, 880 Oak Spring Ln., Libertyville, Ill. 60048

Continuation-in-part of Ser. No. 211,858, Dec. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 767,303, Oct. 14, 1968, abandoned. This application June 29, 1973, Ser. No. 375,037
Int. Cl. B32b *15/02*; B22b *15/04*
U.S. Cl. 29—191 41 Claims



1. An article of manufacture comprising: a ductile member having a plurality of transversely spaced generally longitudinally extending rectilinear, ribbons, adjacent ribbons being parallel with one another and cooperating to define a pair of ribbons and said member including a plurality of such pairs, said ribbons being continuous in length and having opposite longitudinally extending edges, the edges on adjacent ribbons being spaced from one another by a finite distance at spaced locations along their respective lengths to define a row of longitudinally spaced and longitudinally aligned openings between adjacent ribbons of each pair, the openings which define slots in plane section in each row being separated by a web portion that extends transversely and perpendicularly between ribbons of a pair of ribbons, each ribbon including alternating, longitudinally spaced crests and troughs, the crests extending upwardly from a reference plane and the troughs extending downwardly from the reference plane, the transitional portion of each ribbon between the crests and troughs being undeformed and extending at an angle with respect to the reference plane, the crests on each ribbon being aligned with a trough on the adjacent ribbon of its pair of ribbons whereby the aligned transitional portions of adjacent ribbons of each pair of ribbons are disposed at angles that are positioned oppositely with respect to said reference plane, each of said webs being continuous and having a finite length which extends from a first end portion merging with a transitional portion of one ribbon of its pair of ribbons to a second end portion merging with the aligned transitional portion of the adjacent ribbon of its pair of ribbons, the dimensions of said webs being selected such that the intermediate portion of each web between its end portions is twisted throughout its length.

3,869,779
DUPLEX ALUMINIZED COATINGS

Michael A. Gedwill, North Olmsted, and Salvatore J. Grisaffe, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

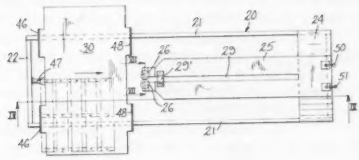
Division of Ser. No. 298,156, Oct. 16, 1972,. This application Jan. 24, 1974, Ser. No. 436,315
Int. Cl. B32b *15/00*
U.S. Cl. 29—194 9 Claims

1. A coated article of manufacture comprising
a superalloy substrate selected from the group consisting of nickel-base superalloys and cobalt-base superalloys, dispersion-strengthened alloys, composites, and directional eutectics,
a ductile, oxidation resistant metallic alloy layer covering said substrate, and
an aluminide coating covering said metallic alloy layer.

3,869,780
UNNAILER

Oscar H. Ginnow, and Roger H. Ginnow, both of Hopbrook Rd., Bethany, Conn. 06801

Filed Nov. 1, 1973, Ser. No. 411,697
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 D 7 Claims

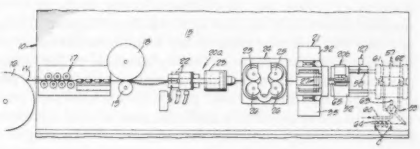


1. A machine for disassembling nailed wooden pallets comprising a base frame, nail cutting means, an elongated support for said cutting means mounted at one end on said base frame, a support for a pallet, means for causing relative movement of said supports to bring a pallet on the pallet support into nail cutting engagement with the cutting means and to effect cutting of the nails by continued relative movement of said supports.

3,869,781
APPARATUS FOR ATTACHING TERMINALS TO ELECTRIC CONDUCTORS

Edward F. Eubanks, Pasadena, and Lloyd A. Talley, Valinda, both of Calif., assignors to Eubanks Engineering Co., Monrovia, Calif., by said Talley

Filed Feb. 25, 1974, Ser. No. 445,532
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 DT 17 Claims

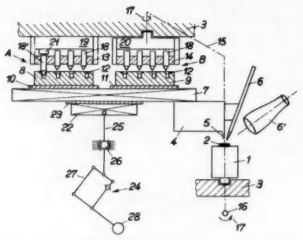


1. Apparatus for attaching terminals to the ends of electric conductors, comprising:
a. means for axially delivering predetermined lengths of electric conductors endwise into a conductor supply zone;
b. a terminal attaching zone spaced from said conductor supply zone, including cooperable terminal attaching die means;
c. means for feeding a supply of terminals to said die means, each of said terminals having a portion adapted to receive an end of said conductor;
d. means for successively picking up and transporting the conductor lengths laterally from the conductor supply zone to a position in said terminal attaching zone, in which said end of the conductor is disposed for reception by said terminal portion; and
e. means including said die means for crimping said terminal portion on the received conductor end.

3,869,782
MACHINE FOR WIRING A SEMICONDUCTOR COMPONENT

Karl Nicklaus, Steinhausen, Switzerland, assignor to Esec Sales S. A., Zug, Switzerland

Filed Nov. 2, 1973, Ser. No. 412,252
Claims priority, application Switzerland, Nov. 10, 1972, 16404/72
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **9 Claims**



1. Machine for wiring a semiconductor component including an integrated circuit and a connecting element, comprising a machine frame, a working head for supplying and soldering wires to the integrated circuit and the connecting element for effecting wire connections between corresponding connecting points on the integrated circuit and the connecting element, a first cross carriage movable horizontally in two mutually perpendicular directions, said working head mounted on said cross carriage for movement therewith, a first positioning unit coordinated with the connecting points on the integrated circuit, a second positioning unit coordinated with the connecting points on the connecting element, each of said first and second positioning units comprising a horizontally arranged program plate, means for individually and releaseably securing said program plates to said first cross carriage, each of said program plates having a number of laterally spaced vertically extending countersunk holes, with the sides of said countersunk portion of said holes having a frusto-conical configuration converging inwardly into said program plate, each of said first and second positioning units including a support means mounted on said machine frame and aligned opposite and in facing relationship with the surface containing said countersunk holes in said program plate of the same said positioning unit, each of said support means includes a plurality of vertically displaceable pins with each of said pins arranged to correspond to a different one of said countersunk holes and having a conically shaped point, the spacing of each said countersunk hole in said program plate from a reference hole, in two mutually perpendicular directions, being equal to the sum of the spacing of the connecting point to which the hole corresponds from a reference connecting point plus the spacing of said pin corresponding to the hole from said pin corresponding to the reference hole, and each of said support means includes a drive mechanism for the introduction of said pins into said countersunk holes so that the introduction can be effected alternately between said first and second positioning units and in succession with respect to said pins in one said support means.

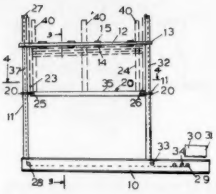
3,869,783
MACHINE FOR STRIPPING PLANKS FROM FRAMES

Kenneth M. Spencer, Union City, Pa., assignor to Recycle Pallets Inc., Union City, Pa.

Filed May 4, 1973, Ser. No. 357,222
Int. Cl. B23p *19/04*
U.S. Cl. 29—244 **6 Claims**

1. A machine for stripping the planks from frame members of pallets comprising

a base beam,
two spaced columns fixed to said base beam and extending upwardly therefrom,
a top beam fixed to said columns in spaced relation to said base beam,
said top beam being made of two laterally spaced structural members adapted to allow the frame members of said pallets to pass therebetween,
and means on said spaced structural members to engage said planks of said pallets,
a pull bar supported in parallel relation to said base and slidably engaging said columns,

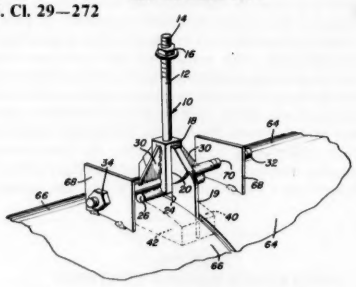


two cables,
one said cable extending downwardly through each of said columns and the other cable being attached to said pull bar,
a roller fixed to the upper end of each said column,
each said cable passing over said rollers,
said cables each having a first end and a second end,
said first ends of said cables each being fixed to said pull bar,
said second ends of said cables each being connected to a tension means.

3,869,784
TOOL FOR ALIGNING ARTICLES

Richard R. Simpson, 2817 Oak Cove, West Memphis, Ark. 72301

Filed Oct. 3, 1973, Ser. No. 402,986
Int. Cl. B25b *5/14*
U.S. Cl. 29—272 **8 Claims**



1. A tool for aligning articles, said tool including a body blade having first and opposite end marginal portions, a pair of abutment blocks supported from said first end marginal portion, projecting outwardly from opposite sides of said blade and including abutment surfaces extending generally parallel to said first end marginal portion and facing toward said opposite end marginal portion, said opposite end marginal portion including an elongated shank anchored thereto at one end and projecting edgewise outwardly from said opposite end marginal portion, a carriage sleeve telescoped over said shank and including a slotted end in which said blade is slidingly received, a guide slot formed in said blade and extending along a line extending between said first and opposite end marginal portions, the slotted end of said sleeve including abutment means projecting outwardly from opposite sides

thereof on opposite sides of said guide slot, the other end of said shank and said sleeve including abutment means for operative connection with thrust developing means to lengthwise advance said shank relative to said sleeve in the direction in which said shank end remote from the slotted end of the sleeve faces, said abutment means including endwise outwardly projecting shank extensions displaced toward the end of the sleeve remote from the slotted end thereof, the remote ends of said extensions being threaded and having threaded thrust members threadingly engaged therewith.

3,869,785

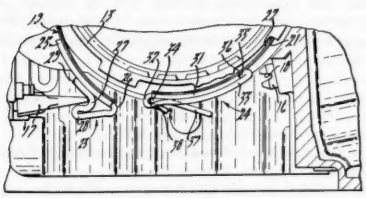
METHOD OF CONVERTING ONE TYPE OF BRAKE BAND TO ANOTHER TYPE

Thomas J. Victory, 25167 Harcourt, Farmington, Mich. 48024

Continuation of Ser. No. 358,106, May 7, 1973, abandoned, which is a division of Ser. No. 269,534, July 7, 1972, Pat. No. 3,747,713. This application Mar. 6, 1974, Ser. No. 448,710

Int. Cl. B23p *7/00*

U.S. Cl. 29—401 **8 Claims**



1. In a method for converting a brake band of the type having end connections with double folds to a brake band capable of longitudinal insertion between a drum and housing, the steps of severing the outer fold of one end connection from the juncture between folds, removing that end connection except for the outer fold, reforming the outer fold so that it may enter the gap between the drum and housing, providing a bracket which has a nose receivable by said outer fold and means engageable by a force-applying member carried by the housing, then assembling the bracket within the housing, and securing the bracket in place.

3,869,786

SEMICONDUCTOR COMPONENT AND ITS METHOD OF MANUFACTURING

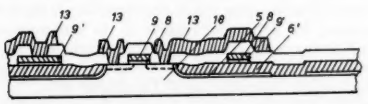
Fritz Gunter Adam, Freiburg, and Albrecht Renz, Hugstetten, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,222

Claims priority, application Germany, Oct. 21, 1972, 2251823

Int. Cl. B01j *17/00*

U.S. Cl. 29—571 **13 Claims**



1. A method of manufacturing a semiconductor component wherein an electrically conductive field plane layer is manufactured concentrically, in a self-aligning manner on an insulating intermediate layer of a semiconductor body comprising:

producing a first layer of silicon oxide over a portion of a polished end-type silicon wafer;

depositing an oxidation masking layer over said silicon oxide layer, said masking layer extending beyond said silicon oxide layer;

thermally oxidizing the exposed surface area of said silicon wafer;

etching away the thermally oxidized area leaving a mesa-shaped projection beneath said silicon oxide layer;

depositing an insulating layer having a window therein on the exposed surface area of said silicon wafer;

depositing a doped polycrystalline silicon layer over the exposed surface area of said component, said polycrystalline layer having a thickness substantially equal to the height of said mesa-shaped projection;

producing a second layer of silicon oxide on the surface of said polycrystalline layer;

producing a window in said second layer concentrically over said mesa-shaped projection, said window having a smaller diameter than said projection;

etching through the window in said second layer to the surface of said oxidation masking layer;

removing said oxidation masking layer;

etching away said second layer, said first layer and that portion of said doped polycrystalline silicon layer lying above said projection and extending outwardly from the space previously occupied by said oxidation masking layer;

depositing a gate oxide layer over the entire surface area of said component;

applying a second coating of polycrystalline silicon over said gate oxide layer;

forming an oxide film over said second coating;

oxide etching said second coating and said gate oxide layer leaving said gate oxide layer and a gate electrode concentrically over said projection and defining a desired conductor pattern over said polycrystalline layer;

diffusing source and drain regions into the surface of said projection;

depositing an oxide coating over the surface area of said component;

etching contact windows over said source and drain regions and said defined conductor pattern; and

applying conductors to said source and drain regions and said conductor pattern.

3,869,787

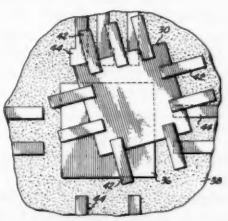
METHOD FOR PRECISELY ALIGNING CIRCUIT DEVICES COARSELY POSITIONED ON A SUBSTRATE

Charles Wayne Umbaugh, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1973, Ser. No. 320,233

Int. Cl. B01j *17/00*

U.S. Cl. 29—577 **11 Claims**



1. In the fabrication of microminiature electronic apparatus, a method for precisely aligning semiconductor integrated circuit chips on a substrate, comprising the steps of:

depositing on an area of the substrate a layer of fluid material, the area having planar dimensions essentially equal to those of the entire back surface of a chip, the fluid

material capable of wetting the back surface of the chip but not capable of wetting the body of the chip;

placing the back surface of the chip coarsely positioned on the deposited layer of fluid material, thereby allowing surface tension of the fluid material to precisely align the chip on the substrate.

3,869,788

METHOD OF MAKING A DISK OR CUP ROTOR

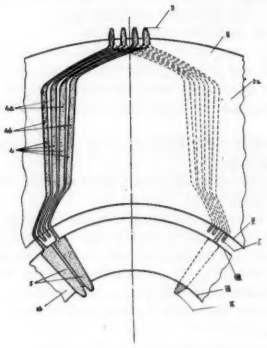
Dumitru Florian Lazaroiu; Sigmund Sleiher, and Gheroghe Mihai Mihaiescu, all of Bucharest, Romania, assignors to Institutul De Cercetare Si proiectare Pentru Industria Electrotechnica, Bucharest, Romania

Filed Mar. 26, 1973, Ser. No. 345,216

Claims priority, application Romania, Apr. 28, 1972, 70740

Int. Cl. H01r *43/00*

U.S. Cl. 29—597 **5 Claims**



1. A method of making a rotor comprising the steps of:

stamping from a metal foil a conductor blank having a plurality of conductors arrayed in groups of at least two said conductors terminating at an inner and outer edge, and said blank terminating with an addition beyond each of said inner and outer edges, said conductors having a commutator bar formed as an extension thereof;

laminating a pair of said blanks back to back on a pair of concentric insulating bodies defining a gap juxtaposed with said conductors and adjacent said commutator bars and with said additions extending beyond associated edge of said bodies;

punching out at least every second conductor at said gap to leave only one of the conductors of each group connected to its respective commutator bar;

cutting off said inner and outer edge additions; and

connecting together said conductors at said gap, at said outer edge, and at said inner edge, thereby forming a primary winding element.

3,869,789

METHOD OF MANUFACTURING VARIABLE RESISTANCE DEVICE

Charles W. Yungblut, and Robert D. Hill, Jr., both of Irvine, Calif., assignors to Spectrol Electronics Corporation, City of Industry, Calif.

Filed May 31, 1974, Ser. No. 475,087

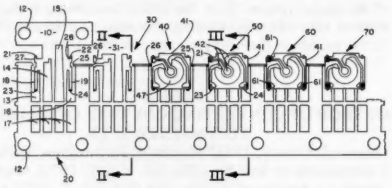
Int. Cl. H01c *17/00*

U.S. Cl. 29—610 **6 Claims**

1. A process for producing a variable resistance device by intermittently advancing a strip of electrically conductive material through a plurality of work stations comprising the steps of:

bending portions of the conductive material to form a plurality of guides;

placing a substrate having a resistance track and a conductive track formed on a first surface thereof, onto said conductive material, said guides maintaining the substrate accurately positioned relative to said material;



bending preselected ones of said guides into overlapping relation with the first surface of the substrate; and

permanently affixing said preselected ones of said guides into said overlapping relation with the surface of said substrate, said preselected ones of said guides forming termination tabs for terminal pins of the resistance device.

3,869,790

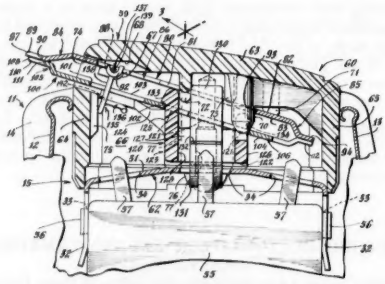
HAIR TRIMMER

Richard Ihasz, Milford, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed July 30, 1973, Ser. No. 383,673

Int. Cl. B26b *19/06*

U.S. Cl. 30—90 **5 Claims**



1. A hair trimmer adapted for connection to a motor operated electric shaver, the trimmer comprising:

a. a housing;

b. means for connecting the housing to the shaver;

c. a stationary cutter removably secured within and the housing and having cutter teeth arranged externally of the housing, means on the housing for securing the stationary cutter to the housing, a movable cutter within the housing adapted for movement relative to the stationary cutter and having cutter teeth on a portion extending externally of the housing and which teeth cooperate with the cutter teeth of the stationary cutter for cutting hair;

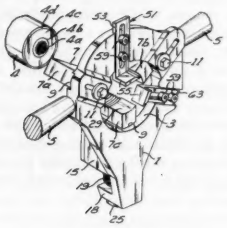
d. cutter supporting means adapted to be driven by the shaver motor and for supporting the movable cutter for movement therewith; and

e. holding means for detachably connecting the movable cutter to the cutter supporting means and slidably contacting the driven supporting means to urge the movable cutter into sliding engagement with the stationary cutter thereby interlocking the stationary and movable cutter but permitting relative movement therebetween.

3,869,791
TOOL FOR REMOVING COVERING MATERIAL FROM A CABLE

Raymond G. Horrocks, Parkview, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed June 14, 1973, Ser. No. 370,000
Int. Cl. H02g *1/12*
U.S. Cl. 30—90.1 **6 Claims**

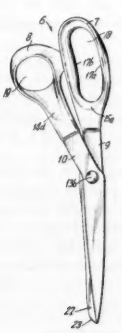


1. A tool of the class described comprising a ring shaped body having front and rear sides and an opening therethrough to receive a cable, jaws projecting from one side of said ring and extending radially relative to said opening to engage the outer surface of a cable therein, means securing certain of said jaws in predetermined fixed positions relative to said opening, means securing another of said jaws in adjusted position relative to said opening, and a blade projecting from and adjustably attached to one side of said ring and projecting into engagement with covering material on a cable in said opening.

3,869,792
FINGER GRIP-CONTOURED MOLDED SCISSORS

Italo Marco Levi Laurenti, c/o Lindar Manufacturing Corp., 432 Park Ave., South, New York, N.Y. 10022

Filed Jan. 28, 1974, Ser. No. 436,856
Int. Cl. B26b *13/06, 13/12*
U.S. Cl. 30—254 **3 Claims**

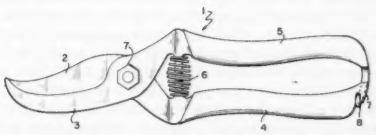


1. A scissors device comprising in combination: substantially flat-faced first and second blade elements and pivot means for pivotably mounting together the first and second blade elements operatively, each blade element having each of upper and lower faces extending in respective flat planes in both longitudinal and transverse directions, ranging from a blade elements operatively, each blade element having each of upper and lower faces extending in respective flat planes in handle-mountable terminal shank portions of the first and second blade elements extending angularly laterally relative to its respective blade portion's longitudinal axis and relative to the remaining shank portion of the other of the first and second blade elements, each of the blade portions of the first and second blade elements including a cutting edge and an opposite backing edge, and a blade-tip back edge of said remaining one of the first and second blade elements defining a broad blade side face between the blade back edge and the cutting edge, and the blade back edge further defining a round terminal edge extending to the cutting edge thereof; a substantially circular thumb-ring-defining handle mounted on said one angularly laterally-extending terminal shank portion of said one's blade element, the thumb-ring-defining handle being mounted at a point spaced-away from said remaining other shank portion and including handle structure defining a passage extending angularly from a lower forwardly direction to a top upper rearwardly direction through its lower and upper surfaces relative to said one's shank portion which extend in said flat plane from forwardly to rearwardly into the handle forwardly of the passage, and the thumb-ring-defining handle including substantially thin walls extending substantially lineally in the direction of the passage and defining a flange extending laterally from an outer ring side surface in a direction such that the flange is abuttable of a side of the ring-handle of the remaining one's of the first and second blade elements, the thumb-ring-defining handle lower mouth-forming portion adjacent the mounted terminal shank portion thereof being rounded and angularly inclined and defining a slot narrowing toward the blade element shank portions thereof providing an elongated converging seat for a digital end of a person's thumb inserted from a rearward upper direction of the thumb-ring-defining handle; and the remaining one's of the first and second blade elements having mounted on its handle-mountable terminal shank portion an elongated fingers-mounting ring structure mounted of the remaining blade element and being mounted at a point spaced-away from said one angularly extending terminal shank portion and defining a through-channel between its upper and lower surfaces with the through-channel having a cross-section of substantially elliptical shape with one longitudinally-extending side wall relative to the elliptical fingers-mounting ring being substantially concave on an inner ring side away from the thumb-ring-defining handle with an opposite longitudinally-extending side walls relative to the elliptical fingers-mounting being substantially convex on an inner ring side adjacent the thumb-ring-defining handle, upper and lower forming portions of the through-channel defining fingers-mounting ring structure adjacent the mounted terminal shank portion thereof being rounded and inclined angularly toward the mounted terminal shank portions thereof such that each of upper and lower mouth-forming portions define a seat receivable of a forward side edge of an index finger.

3,869,793
LATCH FOR HAND TOOL

William C. Ferguson, Denville, N.J., assignor to J. Wiss & Sons Co., Newark, N.J.

Filed Feb. 19, 1974, Ser. No. 443,733
Int. Cl. B26b *13/16*
U.S. Cl. 30—262 **8 Claims**



1. In a hand tool having a pair of working elements, an elongated handle attached at one end to each working element, pivot means for pivotally connecting one handle and working element to the other and spring means urging the

handles apart, the improvement which consists of a latch means comprising:

a flexible plastic or rubber arm centrally disposed on the other end of one handle and having a normal position extending away from said handle at an acute angle thereto and toward said other handle, said arm having an elastic memory such that said arm urges itself back to said normal position when bent to another position;

an elongated tab having upper and lower convex surfaces, the free end of said arm being connected to the upper surface of the tab substantially at the middle of the tab; and

a hook means on the other end of said other handle, said hook means comprising a pair of opposed walls having convex tops and forming therebetween a passageway accommodating said arm when said latch is latched, each wall having a notch tapering inwardly from the edge of the wall remote from the one handle to the edge of the wall adjacent the one handle for accommodating at least a portion of said tab, said notch being substantially complementary to said portion of said tab and permitting free passage of said tab in and out of said notch, the lower surface of said tab when said arm is in the normal position being spaced from the convex tops of said walls.

3,869,794

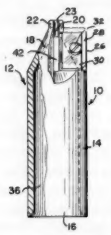
CANDLE SHAPING APPARATUS

Joseph Leigh Smith, 630 Lenox, Glen Ellyn, Ill. 60137

Filed Oct. 25, 1973, Ser. No. 409,696

Int. Cl. B26b *3/00*

U.S. Cl. 30—278 **3 Claims**



1. A candle shaping apparatus for reforming the end of a burned candle or the like in a neat and pleasing and generally symmetrical shape without shearing the candle wick, including hollow guide sleeve means open at one end thereof to receive a candle for reforming, said guide sleeve means having a central axis extending along the length thereof, guide cap means positioned over the opposite end of said guide sleeve means, said guide cap means having a top opening formed in one end thereof aligned with said central axis of said guide sleeve means and a guide chimney surrounding a portion of said opening and extending a short distance along said central axis relative to said opening, said guide cap means having cutting means mounted thereon, said cutting means having a cutting edge for engaging said candle and being disposed relative to said central axis of said guide sleeve means such that said cutting edge will continuously engage an edge of said burned end of said deformed candle as said candle is moved upwardly within and angularly relative to said guide sleeve means to thereby cut away the deformed portions of said candle and reform the end thereof, said cutting edge of said cutting means being spaced a selected distance from a facing edge of a side surface of said guide cap means to form an elongated guide channel opening in said side surface of said guide cap means between the base and said top opening thereof said guide chimney being open on its side facing said guide channel and mating with said guide channel to allow the wick of said candle to be moved upwardly within said guide channel opening toward said top opening to assist in positioning the wick and thereby the candle within said guide sleeve means and said guide cap means relative to said cutting means such that the burned end of said candle may be moved into intimate contact with said cutting edge of said cutting blade to assure a generally symmetrical and uniform cutting of the burned end of said candle while preventing accidental shearing of the wick by said cutting edge.

2. The candle shaping apparatus of claim **1** wherein said cutting means is mounted on a cutting means platform formed in said guide cap means, said cutting means platform being disposed at a selected angle relative to said central axis of said guide sleeve means, said cutting means being positioned parallel and adjacent to a surface of said platform and having a cutting edge projecting slightly inwardly toward said central axis of said guide sleeve means to engage a burned edge of said candle when said candle is positioned within said guide sleeve means, the angle at which said cutting means platform is inclined and said cutting means is thereby positioned corresponding to the general cross-sectional configuration of said guide cap means.

3,869,795

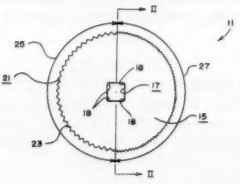
CUTTING BLADE FOR USE WITH AN OSCILLATING CAST CUTTER

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.

Filed June 20, 1973, Ser. No. 371,672

Int. Cl. B27b *9/00, 33/08*

U.S. Cl. 30—388 **3 Claims**



1. A cutting blade for use with an oscillating cast cutter having a drive arbor including a square-shaped portion, said cutting blade comprising:

a. a circular body portion having a square-shaped aperture for selectively positioning said body portion on the square-shaped portion of the drive arbor in one of four positions, said square-shaped aperture including radii portions in each corner thereof to reduce the stress concentration at the corners; and

b. a cutting portion located on the periphery of said body portion, said cutting portion including a first segment of coarse cutting teeth around substantially 180° of said body portion and a second segment of fine cutting teeth around substantially the other 180° of said body portion, said cutting portion including radii portions at the base of each cutting tooth to prevent the clogging thereof.

3,869,796

SLOTTED CHUCK FOR TOOL HOLDER

Fred T. Thorburn, Kirkland, Wash., assignor to Shofu Dental Corporation, Menlo Park, Calif.

Filed Dec. 11, 1972, Ser. No. 313,868

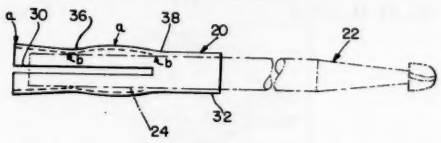
Int. Cl. A61c *1/08*

U.S. Cl. 32—26 **7 Claims**

1. A slotted chuck for a tool holder of the type having a hollow cylindrical spindle driven by a rotary motor for use with a tool having a cylindrical shaft comprising:

holding means having a resilient slotted end connected to a continuous cylindrical end and insertable within said spindle for holding the shaft of said tool within said spin-

dle, said slotted end including an outer frictional surface permanently bent radially outwardly into engagement with inner surface of the spindle, an inner frictional surface deflectable radially into engagement with the outer surface of the toolshaft, said outer frictional surface lying longitudinally more closely to said continuous cylindrical end than said inner frictional surface whereby a greater



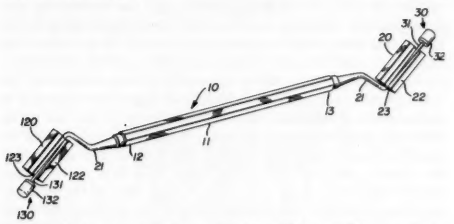
friction force is effected between the spindle and the chuck than between the chuck and the tool shaft and wherein said frictional surfaces are deflected by the toolshaft upon insertion into the resilient slotted end within the spindle to tightly press said outer surface and said inner surface against said respective spindle and toolshaft surfaces.

3,869,797

INSTRUMENT EXCHANGER

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Filed Feb. 9, 1972, Ser. No. 224,840
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **6 Claims**



1. An instrument exchanger for handling small instruments, comprising:

A. an elongate handle;

B. a pair of instrument-carrying members

1. disposed on opposed ends of said handle and

2. each having an exposed magnetized instrument-receiving surface thereon and;

C. each of said instrument-receiving surfaces having locating means thereon including at least one guide groove adapted to receive at least the operative portion of said instruments.

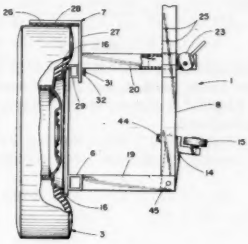
3,869,798

QUICK-CHECK ALIGNER

Edward D. Wilkerson, P.O. Box 755 S. Court, Normandy Beach, N.J. 08739

Filed Dec. 19, 1973, Ser. No. 425,990
Int. Cl. G01c *15/00;* **G01b** *5/255*
U.S. Cl. 33—264 **6 Claims**

1. In an optical-transit aligner unit for a wheel-tire assembly, the improved assembly mount comprising an elongated aligner post adapted for generally vertical disposition by support upon an assembly to be checked for alignment, an upper extension arm adjustably coupled to a general midportion of the aligner post, a mounting hanger carried by an end of the upper extension arm remote from the aligner post, said mounting hanger being the sole mounting hanger of the aligner unit, the mounting hanger including a friction element for frictionally engaging the uppermost portion of a tire tread and a second element for contacting a first mounting reference point on the wheel rim in the assembly, a lower extension arm fixed to and projecting perpendicularly from the lower extremity of the aligner post, and a contact arm carried by an end of the lower extension arm remote from the aligner post with the contact arm and the lower extension being disposed



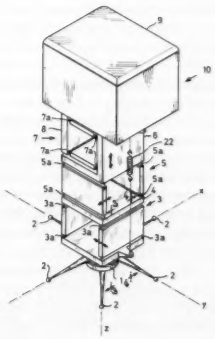
generally perpendicular to one another and in the same plane so that the projecting extremities of the contact arm nest against second and third contact reference points on the wheel rim on the assembly.

3,869,799

UNIVERSAL MULTI-COORDINATE SENSOR

Harald Neuer, Wasseralfingen; Franz Szenger, Konigsbronn; Klaus Herzog, Heidenheim, and Joachim Neumann, Oberkochen, all of Germany, assignors to Carl Zeiss-Stiftung, Wuerttemberg, Germany

Filed Aug. 27, 1973, Ser. No. 391,819
Claims priority, application Germany, Aug. 29, 1972, 2242355
Int. Cl. G01b *7/28*
U.S. Cl. 33—174 L **13 Claims**



1. Multi-coordinate sensor means, comprising a mountable frame, a first torsionally rigid spring parallelogram suspension having a single degree of freedom and having one side fixedly mounted to said frame whereby the opposite side is movable with respect to said one side in essentially only the direction of said single degree of freedom, a second torsionally rigid spring parallelogram suspension having a single degree of freedom and having one side fixedly mounted to said opposite side of said first parallelogram suspension, said second degree of freedom being in a direction generally transverse to that of said first degree of freedom, whereby the opposite side of said second parallelogram suspension is movable with respect to said one side of said first parallelogram suspension in essentially only the directions of said first and second degrees of freedom, work-contacting probe-supporting means torsionally rigidly carried by said opposite side of said second parallelogram suspension, and first and second torsionally rigid force-transfer mechanisms connected to said frame and respectively

and independently to the first and to the second of said opposite sides and including separate electrical force-developing transducers producing force only in said first and second directions, respectively, and a work-contacting probe element carried by said probe-supporting means.

3,869,800

MEASURING APPARATUS AND SYSTEM

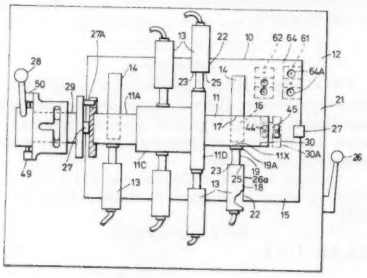
Christopher Leslie Bartlett, and Peter Charles Willis, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Dec. 27, 1972, Ser. No. 318,983

Claims priority, application Great Britain, Dec. 31, 1971, 60956/71

Int. Cl. G01b *7/02, 7/12;* **B01b** *7/31*

U.S. Cl. 33—174 L **1 Claim**



1. Apparatus for determining a dimension of a given surface of a component comprising a fixture for supporting the component, a probe body connected to the fixture, a sensing element supported on said probe body for movement relative thereto, the sensing element being engageable with said given surface when the component is present in the fixture, electrical means responsive to the position of the sensing element relative to said probe body for producing a first output signal, means for zeroing the output signal for a given position of said sensing element and for making the first output signal positive and negative when the element is moved to the respective sides of the given position, a master representing said component and having a given surface corresponding to said given surface of the component and being supportable on the fixture in place of the component, a computer having a data store, means contained in said store representing a dimension being the predetermined actual dimension of the master at said given surface thereof, means contained in said store representing a predetermined range of acceptable dimensions of the component at said given surface thereof, means for reading the first output signal of the electrical means into said store and thereby produce in the store means representing respectively a second output signal produced when the sensing element is engaged with said given surface of the master and a third output signal produced when the sensing element is engaged with said given surface of the component, and program means provided in the computer to produce the algebraic sum of said actual dimension of the master and said second and third output signals, said sum representing a dimension being the actual dimension of the component at said given surface thereof, said programme means including means for determining if said component dimension lies within said acceptable range.

3,869,801

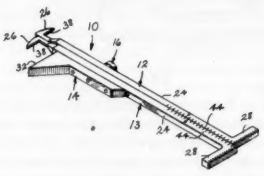
GAUGE FOR MEASURING THE DEGREE OF ALIGNMENT AT THE INNER SURFACES OF TWO TUBULAR MEMBERS POSITIONED END TO END

Goodwin A. Lycan, Lot 53, Mobile Villiage, Stevensville, Mich. 49127

Filed June 17, 1974, Ser. No. 480,125

Int. Cl. G01b *3/20*

U.S. Cl. 33—174 R **7 Claims**



1. In a gauge for measuring the degree of alignment of two tubular members positioned end to end in a spaced relationship, each tubular member including a side wall having inner and outer surfaces, said alignment being measured at the inner surfaces of said tubular member side walls, said gauge including parallel first and second bar members having mutually contacting side faces which extend longitudinally of the bar members, said first bar member being shiftable lengthwise relative to said second bar member over the contacting side faces thereof, said bar members having corresponding juxtaposed end parts, each end part being defined by a contact, the contact of said first bar member and the contact of said second bar member projecting oppositely of one another in the same plane, each contact including an edge face disposed at substantially a right angle to said side faces of the bar members, the improvement comprising a shoulder part carried by said first bar member spaced from the end part thereof, means for shifting said shoulder part along said first bar member toward and away from the contact edge face of the first bar member whereby, when said contacts are inserted between said two tubular members at the ends thereof, said first and second bar members can be slid over one another until the end face of one contact engages the side wall inner surface of one tubular member and the edge face of the other contact engages the side wall inner surface of the other tubular member with said shoulder part shifted into contact with the side wall outer surface of one of the tubular members, said degree of alignment being determined by the location of one edge face relative to the other edge face.

3,869,802

GAUGING APPARATUS

Hans G. Pirner, Hubbardston, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sept. 14, 1973, Ser. No. 397,263

Int. Cl. G01b *7/30*

U.S. Cl. 33—174 L **13 Claims**

1. Apparatus for measuring the angular offset of one portion of an article relative to another portion of said article comprising:

a base member,

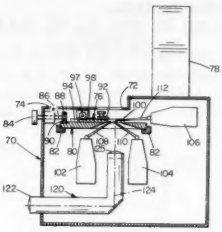
means for supporting said article for placing the apex of the angular offset thereof in a particular position,

two displacement-sensitive transducers mounted on said base so as to sense the positions of two points lying on said another portion;

a third displacement-sensitive transducer mounted on said base as to sense the position of a point lying on said one portion;

a first comparator means for computing the difference between the outputs of the first two said transducers;

a second comparator means for computing the difference between the outputs of said third transducer and the first said comparator means; and



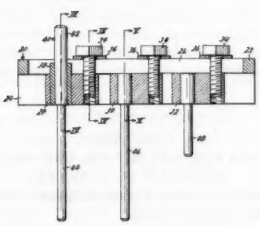
a calibrator means for compensating for the arithmetic influence of the relative displacement of the transducers in accordance with the trigonometric relation of said sensed points.

3,869,803

DRILL GUIDE FOR ENLARGING ENGINE VALVE STEM GUIDES

Merle E. Vaughan, Kansas City, Kans., assignor to Peterson Machine Tool, Inc., Merriam, Kans.

Filed Dec. 17, 1973, Ser. No. 425,304
Int. Cl. G01b *3/30*
U.S. Cl. 33—181 AT **8 Claims**



1. A drill guide for guiding a drill bit in enlarging a worn valve stem guide of an internal combustion engine to receive a shim sleeve having an internal diameter equal to the nominal diameter of said valve stem guide and a larger outside diameter, said drill guide comprising:

a. a straight, rigid guide bar adapted to be positioned above a line of stem guides of the head of said engine normally to the axes of said stem guides,

b. a tubular drill bushing carried by said guide bar normally to the longitudinal extent thereof and adapted to guide a drill bit coaxially therein, said bushing having an internal diameter sized to receive a drill bit for drilling a hole in the engine head for receiving said shim sleeve,

c. at least two pilot rods carried adjustably by said guide bar for movement relative to said guide bar in a direction parallel to the longitudinal extent of said guide bar, said pilot rods projecting normally from said guide bar parallel to but spaced apart from said drill bushing, said pilot rods being insertable simultaneously into certain stem guides of said engine head whereby to position said drill bushing relative to another of said stem guides,

d. means operable to affix each of said pilot rods immovably to said guide bar at any desired point of said adjustable movement, and

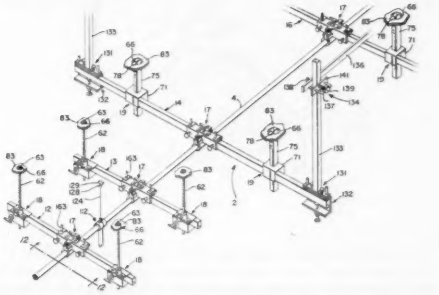
e. a third pilot rod having a portion having a diameter engageable snugly and removably in said drill bushing, and a portion reduced in diameter to a size insertable snugly into a stem guide of said engine head.

3,869,804

VEHICLE FRAME ALIGNMENT GAGE

George R. Friend, 2489 Foxdale Dr., San Jose, Calif. 95122

Filed June 4, 1973, Ser. No. 366,736
Int. Cl. G01c *15/12*; **G01b** *11/26*
U.S. Cl. 33—288 **12 Claims**



7. A vehicle frame alignment gage comprising:

a. an elongated datum member adapted to be suspended below the frame to be aligned;

b. a plurality of datum bars mounted on said datum member for selective adjustment therealong;

c. datum rod assemblies mounted on the ends of said datum bars remote from said datum member and adjustable to control the height between said frame and said datum member;

d. means on the ends of selected ones of said datum bars remote from said datum member constituting a pointer assembly for designating the proper position of a point of reference on said frame whereby during alignment of said frame said pointer assembly designates the proper position of said point of reference in relation to the datum member; and

e. vehicle body alignment means mounted on the end portions of said datum bars remote from said datum member, said vehicle body alignment means including a post adjustably associated with each end of each datum bar, and a bar adjustably mounted on adjacent posts and movable in relation to said vehicle body to form a plane of reference to which measurements may be related.

3,869,805

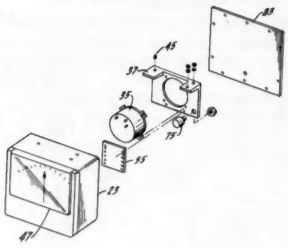
TRACK LEVEL INDICATOR

Andrew M. Dieringer, Waterford, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 175,464, Aug. 27, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,668
Int. Cl. G01c *9/06, 9/12*
U.S. Cl. 33—338 **2 Claims**

1. A railroad track level indicator for installation in a vehicle of the type which travels on railroad tracks, said indicator being constructed and adapted to show differences in elevation between the rails and including a housing constructed and arranged to be mounted on the vehicle, an electric bridge circuit mounted in the housing, a bracket adjustably mounted in the housing, a pendulum mounted on the bracket, a variable contact mounted on the pendulum and movable along one of the resistances in the bridge circuit upon movement of the pendulum and the housing relative to each other as the vehicle moves along the tracks to indicate an out of level condition, an ammeter connected in the bridge circuit having a scale calibrated in inches of elevation and a pointer movable across the scale in response to differences of potential in the bridge

circuit, the adjustable mounting for the bracket and relative to the housing including a pivotal connection for one end of the bracket on one side of the housing so that the bracket may be pivoted about an axis which is generally paralled to the rails; and a spring-biased, manually operable adjustment on the



other side of the housing between the bracket and the housing with operable means extending through the housing so that the bracket may be adjusted to and firmly held at a position wherein said pointer will point to the zero position on the scale while the vehicle is on a section of level track, and means for connecting the bridge circuit to a source of power.

3,869,806

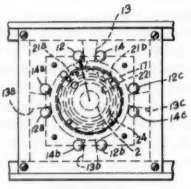
LEVELLING INSTRUMENT

David H. Humphrey, Gen. P.O. Box 2226, San Juan, P.R.

Continuation-in-part of Ser. No. 252,339, May 10, 1972, Pat. No. 3,793,735. This application Jan. 2, 1973, Ser. No. 320,207

Int. Cl. G01c *9/00*

U.S. Cl. 33—348 **15 Claims**



1. A levelling instrument having means for readily determining a level or plumb position which comprises, in combination:

a. a body member having a reference surface;

b. a source of light positioned within the body member;

c. a reflecting surface rotatable about the light source, said reflecting surface adapted to reflect light in a vertical direction irrespective of the position of the reference surface;

d. at least two indicators on the body member responsive to light reflected from the reflective surface when the reference surface is not in a level or plumb position; each indicator indicating a tilt of the reference surface to the left or right respectively; and,

e. means on the body member for focusing and directing the light reflected in a vertical position by the reflecting surface to activate one of said at least two indicators only when the reference surface is not in a level or plumb position, whereby a level position is readily discernible by the lack of activation of any of said indicators.

3,869,807

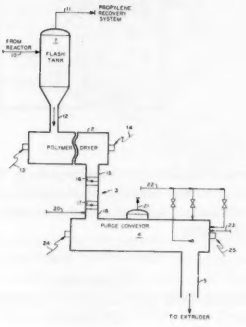
METHOD FOR CREATING INERT GAS BARRIER FOR PRODUCT FEED CONDUIT

Robert J. Perry, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 30, 1973, Ser. No. 383,721

Int. Cl. F26b *3/00*

U.S. Cl. 34—33 **5 Claims**



1. In a system for the transfer of a mass of particulate solids to a receptacle through a vapor lock system consisting essentially of a transfer conduit and at least two butterfly or star-type valves which are opened sequentially a method for minimizing the introduction of vapors into the vapor lock system comprising introducing purge gas into the transfer conduit at a point below the lower most valve and above the lower end of the transfer conduit.

3,869,808

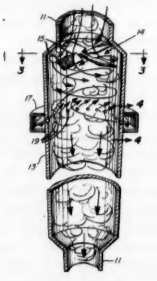
APPARATUS FOR MIXING AIR AND STEAM FOR DELIVERY TO A DRYER

Willard C. Sawyer, Oxford, Maine, assignor to Gorham International Inc., Gorham, Maine

Filed July 5, 1974, Ser. No. 485,965

Int. Cl. F26b *11/02*

U.S. Cl. 34—124 **3 Claims**



1. Apparatus for mixing air and steam for delivery to a dryer, said apparatus including a steam supply conduit in communication with the interior of a cylinder of said dryer, a cylindrical chamber of substantial length in said conduit, means in the inlet end of said chamber to cause the entering steam to spin in one direction, and means to deliver air under pressure into said chamber as an annular series of streams

directed towards said inlet and to spin in the opposite direction relative to the steam, the cross sectional area of the chamber being enough greater than that of the steam conduit to prevent said steam spinning means from being a restriction.

3,869,809

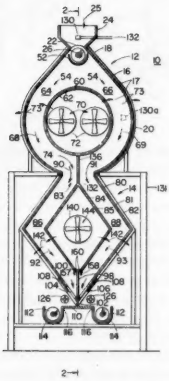
CONTINUOUS FLOW GRAIN DRYING APPARATUS

Robert E. Keirn, R.R. No. 2, North Manchester, Ind. 46962

Continuation-in-part of Ser. No. 230,857, March 1, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 397,068

Int. Cl. F26b *19/00*

U.S. Cl. 34—174 **3 Claims**



1. Continuous flow grain drying apparatus comprising: an upper, foraminous drying enclosure having a top end and an open bottom end, means for introducing grain to be dried to said upper enclosure adjacent said top end for downward gravity flow therethrough, first, enclosed, foraminous duct means in said upper enclosure for defining therewith a first pair of passages therein thereby dividing said downward flow into two separate, parallel streams, means communicating with said first duct means for causing an outward flow of heated air simultaneously through said first passages, a lower foraminous cooling enclosure having an open top end connected to said bottom end of said upper enclosure and having a bottom end, second, enclosed foraminous duct means in said lower enclosure for defining therewith a second pair of passages therein, divider means connecting said first and second duct means and extending through said open ends of said enclosures for coupling respective ones of said first and second passages whereby said two streams respectively continue separate, downward, parallel flow through said second passages, means communicating with said second duct means for causing an outward flow of cooling air simultaneously through said second passages, said cooling air flow being discharged to the atmosphere, said heating and cooling air flows being in parallel, first and second discharge openings in the side wall of said second duct means for respectively separately discharging said streams from said second passages, an imperforate divider plate extending downwardly from said second duct means between said discharge openings for separately discharging said streams from said second passages whereby said two streams are maintained separate without co-mingling throughout their downward flow through said apparatus, a pair of skirt elements depending from said second duct means wall in spaced parallel relationship with said divider plate, said last-named openings respectively communicating with the spaces between said skirt elements and divider plate, said skirt elements being shorter than said divider plate whereby said second streams are respectively subjected to a final flow of cooling air as they are discharged.

3,869,810

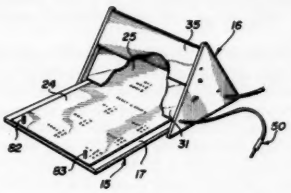
TEACHING MACHINE

Hugh C. Ronalds, 220 Locust St. 26A, Philadelphia, Pa. 19106

Filed Oct. 29, 1973, Ser. No. 410,636

Int. Cl. G09b *7/00*

U.S. Cl. 35—9 C **18 Claims**



1. A teaching machine adapted to use interchangeable cards of electrical insulating material, wherein each card includes a question section and a correct answer section, said question section including a plurality of questions with multiple-choice answers, one of which for each question is correct and at least one of which for each question is incorrect, each card including a hole therethrough adjacent each of the answers and start and reset holes therethrough in the question section, said machine comprising a base for supporting a card and onto which a card may be oriented, terminals on the base registering with the holes, a housing on the base receiving the answer section thereby leaving exposed the question section, said housing including a semi-opaque window, light means in said housing functioning when energized to permit visual reading of the answer section through the window, a hand-held probe for entering the holes in the card to contact the terminals, and electrical circuit means connected to said terminals, probe, and light means responsive to energize the light means when contact by the probe is first made with the terminals of said start hole or the correct answer hole of each question and to prevent energization of the light means in the event contact by the probe is first made with a terminal of an incorrect answer hole until contact by the probe is next made with the terminal of the reset hole.

3,869,811

EDUCATIONAL DEVICE FOR LEARNING THE OSCILLOSCOPE

Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1973, Ser. No. 346,509

Int. Cl. G09b *23/18*

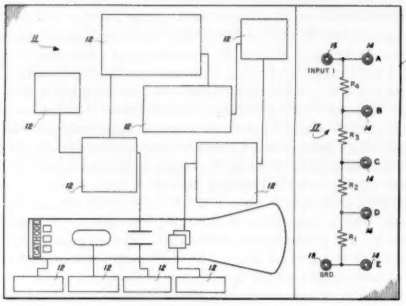
U.S. Cl. 35—19 A **7 Claims**

1. An educational kit for teaching the basic principles about the functioning of an oscilloscope utilizing an oscilloscope and structure comprising in combination:

a. a simulator board having a surface of magnetically attractive material and having (i) on a first area of said board graphic indicia on the surface thereof defining a sectional view of a cathode ray tube and indicia defining a plurality of areas surrounding said cathode ray tube, said areas being used by the user of said kit to graphically depict the mechanisms which control the operation of a cathode ray tube and circuits found within an oscilloscope effecting said control mechanisms whereby the user of said kit can obtain an understanding of the theory behind the functioning of an oscilloscope; (ii) on a second area of said board graphic indicia defining a voltage divided circuit including a plurality of resistors in series, a ground terminal and an input terminal; a plurality of terminal posts

affixed to the upper portion of said board within said circuit, said posts positioned at the ground terminal, the input terminal and by each of the resistors such that each resistor lies between two terminal posts; and a plurality of resistors secured to the bottom portion of the board in the same circuit arrangement that is graphically depicted on the top portion of said board and means to provide a voltage to said input and ground terminals; whereby the user of said kit can learn to use an oscilloscope after obtaining an understanding of the theory of oscilloscopes by securing said voltage means to said circuit and measuring voltage drops with an oscilloscope across said resistors:

b. a plurality of magnetically attractive manipulative pieces each bearing individually on their surfaces graphic indicia defining items found within an oscilloscope, said pieces comprising (i) a plurality of pieces each containing indicia defining control mechanisms found within an oscilloscope and each adapted for positioning within said plurality of areas; and (ii) a plurality of pieces each containing indicia defining various circuit diagrams for said control mechanisms, each adapted for positioning within said plurality of areas, said manipulative pieces adapted for manipulation within the confines of the first area of said



board in sequence within said plurality of areas whereby mechanisms controlling a cathode ray tube and circuits found within an oscilloscope can be graphically depicted, said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces;

c. a display board for said manipulative pieces including a sheet of magnetically attractive material, said display board having graphic indicia on a surface thereof in spaced relationship, said graphic indicia corresponding to the indicia present on each of said manipulative pieces, said manipulative pieces adapted for storage on and removal from said display board; and

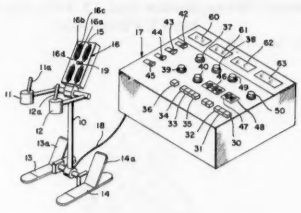
d. audiovisual instructional means for presenting information relevant to the basic principles about the functioning of an oscilloscope including information defining (i) the first and second areas of said board, (ii) the indicia on said pieces, (iii) the indicia on said board, (iv) the relationship of the indicia on the first area of said board to the indicia on said pieces and use of the second area of said board with an oscilloscope whereby the basic principles about an oscilloscope can be learned by the user by using said board in response to said instructional means.

3,869,812

COORDINATION TESTING SYSTEM

Hagop Arakelian, Broomall, and Jeffrey L. Wright, Philadelphia, both of Pa., assignors to J. W. Microelectronics Corporation, Philadelphia, Pa.

Filed Sept. 20, 1973, Ser. No. 399,094
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 R **8 Claims**



1. A system for testing eye-limb coordination comprising:

means for electronically activating selected visual displays, said electronic activating means comprising an electronic read-only memory, and means for activating said memory to put out control signals for sequentially activating different ones of said selected displays, and said read-only memory comprising a counter activated by said memory activating means to produce sequentially increasing number signals and means for transforming said number signals into different signals for activating said selected displays;

limb operable means for selectively actuating visual displays bearing predetermined spatial relation to said electronically activated displays; and

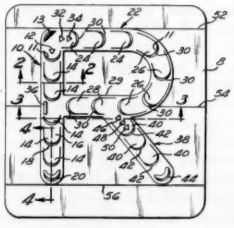
means for indicating the attainment of said predetermined relation.

3,869,813

TEACHING DEVICE FOR FORMING INTELLIGENCE CHARACTERS

Raymond E. Hancy, 6515 E. Vancey Dr., Brook Park, Ohio 44142

Filed Oct. 10, 1973, Ser. No. 404,860
Int. Cl. G09b *11/04*
U.S. Cl. 35—37 **12 Claims**



1. A device for teaching the formation of intelligence characters comprising:

a. a planar card including a visible representation of a character formed of at least one stroke element, and

b. a plurality of individual inclined plane finger slides having a major portion of the surface thereof projecting above the plane of said card and lying along a predetermined stroke in forming said character and configured to encourage movement of the finger in a desired direction along said stroke element.

3,869,814
EXCAVATOR WITH DRAGLINE EQUIPMENT

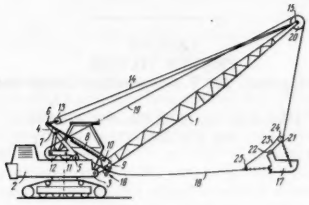
Alexandr Vladimirovich Rannev, ulitsa Veernaya, 3, korpus 4, kv. 68; Arvid Karlovich Reish, ulitsa Barrikadnaya, 19, kv. 55, both of Moscow; Viktor Alexandrovich Svirsky, ulitsa Shevlyakova, 45, kv. 11, Ljubertsky, Moskovskoi oblasti, and Boris Danilovich Khodykin, ulitsa Saikina, 1/2, kv. 128, Moscow, all of U.S.S.R.

Filed July 10, 1973, Ser. No. 377,915

Claims priority, application U.S.S.R., July 11, 1972, 1803101

Int. Cl. E02f *3/48*

U.S. Cl. 37—116 **1 Claim**



1. A dragline excavator comprising a boom pivotally mounted to a turntable of said excavator; hydraulic cylinders serving the purpose of luffing said boom in a vertical plane, said cylinders being pivotally attached to said boom closely adjacent to the pivotal mounting of said boom to said turntable; a frame pivotally mounted on the turntable of the excavator for pivotal movement of the same in a vertical plane, the piston rods of said cylinders being connected to said frame at an upper part thereof; said excavator including a dragline bucket and rope drums disposed on said frame to operate said bucket.

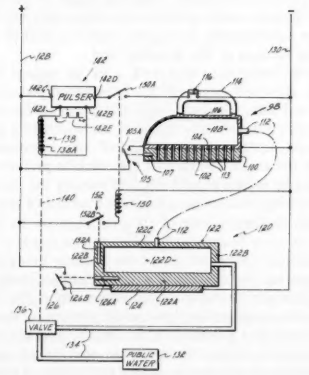
3,869,815
GARMENT FINISHING APPARATUS

Norman J. Bullock, Prospect, Ky., assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Continuation-in-part of Ser. No. 267,518, June 29, 1972, Pat. No. 3,085,561. This application Jan. 4, 1974, Ser. No. 430,630

Int. Cl. D06f *75/06*

U.S. Cl. 38—77.6 **5 Claims**



1. A steam generator connectable to a supply of variable pressure water for providing in response to actuation of a switch steam at a specified rate irrespective of water pressure variations, comprising:

a heat sink having a high temperature surface defining a cavity therein communicating with the atmosphere for containing in contact therewith water which boils at a specified temperature,

a heater in heat transfer relationship to said heat sink for heating said heat sink surface to said high temperature, said high temperature being substantially above said specified boiling temperature,

a thermostatic regulator for maintaining said heat sink surface at approximately said high temperture,

a valve having an outlet connected to said heat sink and having an inlet connectable to said variable pressure water supply, said valve constructed to provide, when open, an output water flow at a constant rate per unit time independent of water supply pressure fluctuations, and

valve control means responsive to continued actuation of said switch for intermittently opening said valve to cause said valve to deliver to said heat sink, on an intermittent basis, a specified quantity of water directly correlated to the time duration said switch is continuously actuated, said intermittent opening of said valve being at a relatively low duty cycle to avoid flooding of said heat sink by prolonged and continuous actuation of said switch.

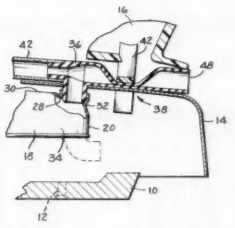
3,869,816
STEAM IRON

Llewellyn D. Busby, Upland, Calif., assignor to General Electric Company

Filed Jan. 30, 1974, Ser. No. 437,851

Int. Cl. D06f *75/06*

U.S. Cl. 38—77.83 **7 Claims**



1. In a steam iron having steam control means, a fill opening to an interior elongated water tank and a steam generating soleplate with ports therein, the improvement in means to clean said tank comprising,

a substantially large opening in said tank in addition to the fill opening,

said large opening being disposed in at least one wall of said tank with at least part of said opening being a smooth flow continuation of an adjacent wall of said tank, and said opening being located at the lowest point of said tank in a selected position of the iron, and

valve means to control said large opening,

whereby said tank may be drained through said opening on operation of said valve means when the iron is in said selected position.

3,869,817
HANDWORK FRAME

Rush A. Bowman, 3723 Oakley, Memphis, Tenn. 38111

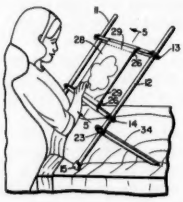
Filed Feb. 1, 1974, Ser. No. 438,717

Int. Cl. D06c *3/08*

U.S. Cl. 38—102.4 **8 Claims**

1. A handwork frame comprising a pair of side members, a pair of parallel cross members slidably mounted at opposite ends on said side members for relative displacement while

maintaining parallelism, flexible worksheet mounting means on said cross members adapted for attachment thereto of the opposite edges of a worksheet of fabric or the like, said worksheet being tensioned to flat condition by relative opposite displacement of said cross members on said side members, means for fixing the ends of said cross members in adjusted position on said side members, said side members having cylindrical sections and said cross members being provided



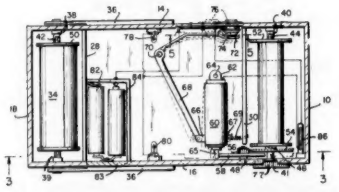
with bores closely slidably frictionally surrounding said cylindrical sections and said fixing means comprising clamp means on the outer ends of said cross members for tightening or loosening the friction fit of said members at said bores, and support means for angularly positioning said frame comprising members at each side having cylindrical bores loosely slidably frictionally surrounding said cylindrical sections of the side members.

3,869,818

PORTABLE ELECTRICALLY ILLUMINATED BOOK

Richard B. Marcellus, 160 9th Ave., Apt. 3R, New York, N.Y. 10011

Filed Dec. 26, 1972, Ser. No. 318,004
Int. Cl. G09f *11/28*
U.S. Cl. 40—31 **4 Claims**



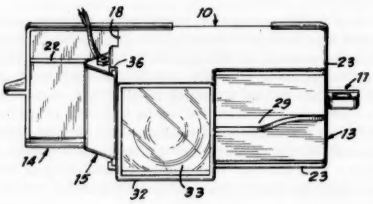
1. A portable electrically illuminated book comprising a housing having opposed front and rear walls opposed side walls, and upper and lower walls, said front wall being formed with a rectangular opening, a translucent shelf spaced parallel to said front wall in said housing and aligned with said opening for supporting a movable paper strip thereon, a detachable spool rotatably mounted in said housing adjacent said lower wall, said spool having a paper strip with reading matter wound thereon, an outer end of said paper strip extending from said spool between said front wall and said shelf, a detachable take-up spool rotatably mounted in said housing adjacent said upper wall, said outer end of the paper strip being secured to said take-up spool, a rotatable take-up spool shaft in one of said side walls detachably secured to said take-up spool, motive means for rotating said take-up spool in said housing, illuminating means in said housing mounted behind said translucent shelf for illuminating reading matter on said paper strip and a power source in said housing for said motive means and said illuminating means, said motive means comprising an electromotor having one end rotatably mounted about a first pivot axis perpendicular to said rear wall, a drive shaft extending from the other end of said motor and parallel to said rear wall, a driven rubber wheel rotatably mounted on said one side wall and adapted for frictional engagement with said drive shaft, a pinion axially secured to said rubber wheel, a gear wheel secured to said take-up spool shaft and engaging said pinion, a two-armed lever having two ends and pivoted therebetween about a second pivot axis perpendicular to said rear wall, said lever having one of said ends pivotally connected to said electromotor for pivoting said electromotor about said first pivot axis, a sliding switch mounted in one of said side walls for electrically actuating said motive means and said illuminating means, said switch having a projection provided with a knob engaging the other end of said lever, said switch being movable from one position to a second position causing said lever to pivot about said second pivot axis and also causing said electromotor to pivot about said first pivot axis and thereby causing said drive shaft to be disengaged from said rubber wheel.

3,869,819

PICTURE VIEWER

John H. Weggeland, 202 E. Bougenvillea, Lehigh Acres, Fla. 33936

Filed July 14, 1972, Ser. No. 272,041
Int. Cl. G09f *11/30*
U.S. Cl. 40—64 A **7 Claims**



1. A picture viewer comprising:

a housing having a forward end and a rearward end, the forward end having a hollow picture-viewing portion with means to illuminate the interior thereof, the rearward end of said housing having a space to accommodate a stack of pictures of uniform width, the pictures having forwardly and rearwardly directed edges,

a shuttle having a forward portion guided longitudinally in said housing between a retracted position with said forward portion in register with the stack of pictures disposed thereon, and a projected position with said forward portion substantially in register with the hollow picture-viewing portion of the housing, and

said shuttle being provided with a rib to engage the rearwardly directed edge of the lowermost picture of the stack and with a forward edge that is spaced from said rib a distance substantially equal to the width of a picture,

said shuttle, upon projection thereof, simultaneously moving the lowermost picture of the stack to picture-viewing position by means of said rib, and moving the picture that is in viewing position to a position forward of the viewing position to form a pile of pictures that are in the same order as were said pictures when in the stack,

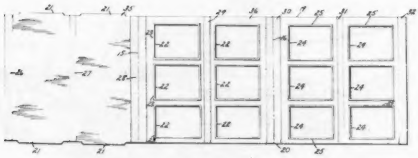
the mentioned rearward end of the housing being provided with spaced guide walls, a weight member being guided by said walls to have a disposition upon the stack to flatten the same so the lowermost picture of the stack is biased to a flat position on the shuttle and the rearward edge of said picture is retained in operative engagement with the rib on the shuttle during projection of the shuttle, and

the weight member being provided with a pocket to store a quantity of extra pictures to increase and decrease the weight of said member according to the number of pictures stored in said pocket.

3,869,820
PHOTOGRAPHIC ALBUM PAGE AND METHOD OF MAKING SAME

Sheldon Holson, 111 Danbury Rd., Norwalk, Conn. 06897

Filed Dec. 10, 1973, Ser. No. 422,992
Int. Cl. G09f 1/10
U.S. Cl. 40—159 1 Claim



1. A photographic album page comprising: a unitary blank of paper having a principal longitudinal axis, including a first lamina imperforate throughout its extent and having a pair of opposed longitudinal edges, a free transversely-extending end edge and an oppositely disposed fold edge, said first lamina having a plurality of laterally extending tabs projecting outwardly of said longitudinal edges; a second lamina hingedly interconnected to and foldably overlying said first lamina and having longitudinal edges coaxially disposed with the longitudinal edges of said first lamina, said second lamina having substantially uniformly sized apertures extending through the plane thereof in elongated areas perpendicular to said longitudinal edges, said second lamina being interconnected to a surface of said first lamina in elongated areas to define a first set of printretaining pockets underlying said apertures, and accessible from openings thereto adjacent said laterally extending projections; and a third lamina similar to said second lamina hingedly interconnected to said second lamina and interconnected to an opposite surface of said first lamina to define a second set of pockets substantially congruent to said first set of pockets, and accessible from openings disposed adjacent an opposite surface of said tabs.

3,869,821
CONNECTOR COMBINED WITH FISHING FLOAT, LEADER, SINKER, OR LURE APPARATUS

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop A Line, Inc., Melbourne, Fla.

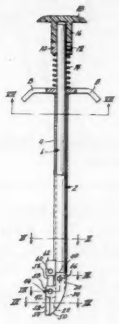
Filed Nov. 26, 1973, Ser. No. 419,175
Int. Cl. A01k 85/00, 91/04
U.S. Cl. 43—42.49 10 Claims

1. A fishing apparatus comprising a shaft means, a substantially circular vertical eye member as an integral extension of one end of said shaft means, a substantially circular horizontal eye member connected to said vertical eye member and encircling said shaft means, and fishing implement means adjacent to and connected to the other end of said shaft means including a fishing lure having a downplane plate, said downplane plate have an enlarged aperture, and wherein said shaft means passes through said downplane plate aperture and had a head on said other end of said shaft means whereby said shaft means is slidably connected to said downplane plate, said enlarged aperture providing sufficient space to permit the passage of a fishing line loop.

3,869,822
FISHHOOK EXTRACTOR

Lloyd E. Tieman, 601 E. 14th St., Carthage, Mo. 64836

Filed July 5, 1973, Ser. No. 376,815
Int. Cl. A01k 97/00
U.S. Cl. 43—53.5 6 Claims



1. A fishhook extractor comprising:

a. a slender, elongated shank,

b. an anvil mounted on one end of said shank, said anvil being elongated in a direction parallel to said shank and having opposite longitudinal edges designated respectively its forward and rearward edges, and being adapted to be engaged interiorly in the bight portion of a fishhook with its forward edge toward the point of said fishhook, said anvil being provided along its rearward edge with a groove adapted to engage the bight portion of the fishhook, said groove extending around the free end of said anvil and opening through the forward edge thereof,

c. a pair of generally planar stripper plates mounted on said extractor and disposed in generally parallel relation at respectively opposite transverse sides of said anvil, whereby to be disposed at opposite sides of the plane of a fishhook engaged by said anvil, said plates being movably associated with said anvil and having operative edges operable by said movement to advance forwardly of said anvil to strip the flesh of a fish from the point of said fishhook, the operative edges of said stripper plates being disposed forwardly of said anvil at all times, and being provided with inturned lips, the lips of the two plates being spaced apart by a distance generally equal to the transverse width of said groove, and,

d. manually operable actuating means mounted on the extractor at the opposite end of said shank operable to produce said relative movement of said anvil and stripper plates.

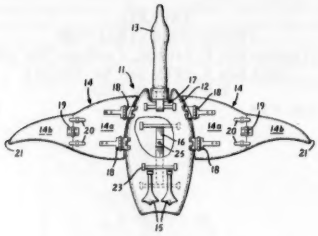
3,869,823
BIRD DECOY

Donald Powers, and Delmar Washechek, both of P.O. Box 2, Kimball, S. Dak. 57355

Filed Aug. 16, 1972, Ser. No. 281,118
Int. Cl. A01m 31/06
U.S. Cl. 43—3 3 Claims

1. A bird decoy comprising a body, a head rotatably connected to the body, two wings connected to the body by hinges, at least one of the wings is further hinged at a point between its respective point of connection with the body and its respective tip, two feet rotatably connected to the body, whereby the head, wings and feet can be positioned so that the decoy resembles a bird in flight and the head, wings and feet can also be folded against the body for storage and transporta-

tion, a stand, and means located on a support frame within the body which are adapted to receive the end of the stand to



allow for display of the decoy in a flight configuration at some distance above the ground.

3,869,824

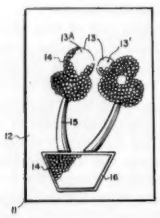
ASSEMBLY TOY AND CRAFT

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 223,148, Feb. 3, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,410

Int. Cl. A63h *33/06*

U.S. Cl. 46—17 **10 Claims**



1. A constructional toy comprising:

a base,

a plurality of small decorative components of different colors adapted to be selectively applied to different areas of said base wherein components of each color respectively cover different areas of said base so as to decorate and differently color said different areas,

means for securing said components in a plurality of nesting arrays on said base, and

a fence-like structure protruding outwardly from the surface of said base and shaped to define a plurality of defined areas of said base surface which defined areas are confined by respective portions of said fence-like structure wherein decorative components of each color are assembled by color within each of said defined areas to compose a three-dimensional surface decoration on said base.

3,869,825

TOY TANK

Harold V. Heberlein, P.O. Box 269, Riverton, Wyo. 82501

Filed May 30, 1974, Ser. No. 474,384

Int. Cl. A63h *17/04*

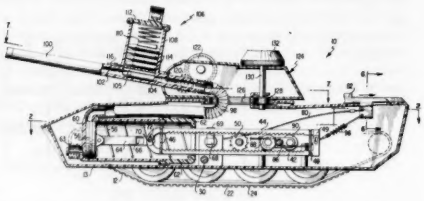
U.S. Cl. 46—219 **10 Claims**

1. A toy tank which is movable in forward and reverse directions comprising in combination:

a moveable chassis having a first means for respectively converting forward and reverse motion of said chassis into forward and reverse rotary motion;

second means mechanically coupled to said first means for converting the forward and reverse rotary motion of said first means into linear motion, said second means being moveable between first and second positions;

cocking means responsive to linear motion of said second means for detaining said second means in the second position in response to forward or reverse motion of said chassis;



projectile firing means capable of selectively ejecting projectiles upon command of an operator, said projectile firing means being mechanically coupled to said second means; and

a trigger mechanism mechanically coupled to said cocking means for selectively releasing said cocking means from detaining said second means in said second position upon pulling by an operator.

3,869,826

CULTIVATION OF PLANTS IN GREENHOUSES

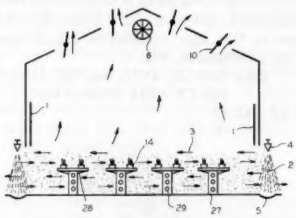
Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/-Rhein, Germany

Continuation of Ser. No. 178,124, Sept. 7, 1971, abandoned. This application June 18, 1973, Ser. No. 371,140

Claims priority, application Germany, Sept. 10, 1970, 2044821

Int. Cl. A01g *9/02, 9/14*

U.S. Cl. 47—17 **10 Claims**

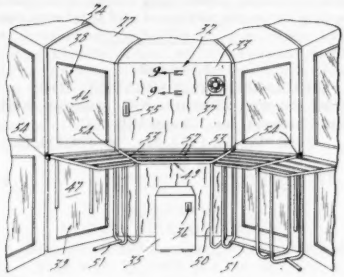


6. A greenhouse for cultivating physiologically and morphologically valuable plants, said greenhouse having openings in the lower portions of at least two side walls of said greenhouse to maintain circulation of air through the greenhouse by natural movement of atmospheric air into openings in one wall and out of openings in another wall, thereby providing in the greenhouse movement of air which is closely similar to the atmospheric air in direction, strength and natural rhythm, and said plants being planted in pot-forming members with soil therein, and said pot-forming members being supported by a plurality of trays, and said trays in turn being supported by racks in said greenhouse, each rack having a plurality of parallel, spaced, horizontal arms with said trays resting on and extending between contiguous arms, whereby the air circulating through said greenhouse may circulate through said racks as well above said racks.

3,869,827
CONVERTIBLE PORTABLE FOLDING GREENHOUSE

John D. Anderson, Holland, and Gerald L. Vander Stel, Grand Rapids, both of Mich., assignors to Avis Products, Inc., Madison Heights, Mich.

Filed June 8, 1973, Ser. No. 368,175
Int. Cl. A01g 9/00; E06b 1/04
U.S. Cl. 47—17 1 Claim



1. In a portable folding greenhouse, a plurality of rectangular flat panels each having side, upper, lower and horizontal central portions, means hingedly connecting the side portions of adjacent panels together so they may be either folded into a collapsed position or unfolded into an erect circular arrangement, each panel having removable upper and lower sections, with each section having a plastic insert with light transmitting but air-impervious properties, means anchoring the lower edges of said panels to the ground, one of said panels being a door panel, a solid panel opposite said door panel, a heater and vent fan mounted on said solid panel, a low temperature-responsive control for said vent fan, radially arranged tubes removably connected to a central hub and having outer ends engaging a cable which runs through the upper portions of said panels, a cover on said tubes forming a roof, the cover continuously extending outwardly from said hub to said panels and being fabricated between the hub and panels entirely of a plastic material having light transmitting but air-impervious properties, a plurality of adjacent benches within said greenhouse, said benches having legs collapsibly connected to tops and inwardly angled edges so that the benches will interfit with each other, and brackets securing said benches to the side portions of said panels.

3,869,828
PLANTER PACKAGE

Mitsuo M. Matsumoto, P.O. Box 17852, Honolulu, Hawaii 96817

Filed July 16, 1973, Ser. No. 379,449
Int. Cl. A01g 9/02
U.S. Cl. 47—34.11 3 Claims

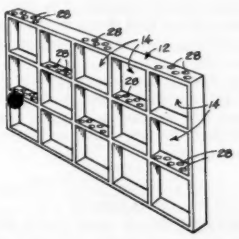
1. A plant display package, comprising:
a first open-topped container;
a quantity of moist paper received within said first container, said plant being disposed therein;
removable means grippingly attached to said first container extending over the open top of said container including, a pair of U-shaped members intersecting one another over said first container and the open ends of which are grippingly received onto the open top of said first container; and
flexible transparent sheetlike means constructed of plastic permeable to atmospheric gases wrapped about said first container and over said attached means, said sheetlike means being sealed sufficiently to retain moisture therewithin; and
a second open-topped container received onto parts of said

first container with said attached means extending outwardly thereof.

3,869,829
TEACHING AID STRUCTURE

Thomas E. Chiosso, 53 Oakwood St., San Francisco, Calif. 9410

Filed Sept. 26, 1973, Ser. No. 400,731
Int. Cl. A01g 9/00
U.S. Cl. 47—39 2 Claims



1. A structure for use as a teaching aid or the like comprising:
a frame of rectangular configuration and comprising a plurality of vertical frame members and a plurality of horizontal frame members, defining a plurality of openings, into at least one of which a plant may be positioned for support by said frame;
a panel member associated with and covering another opening and supported relative to the frame;
a portion of a horizontal frame member having apertures therethrough, and through which water may travel from above into said one opening, the panel member when so covering said another opening being positioned elevationally above said portion of the frame member, so that access is allowed to said apertures from thereabove only upon removal of said panel member.

3,869,830
APPARATUS FOR CLEANING THE CAVITIES OF CASTING AND THE LIKE

Jesse L. Baker, Radford, Va., assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 28, 1973, Ser. No. 401,890
Int. Cl. B24c 3/04, 3/32
U.S. Cl. 51—8 R 5 Claims

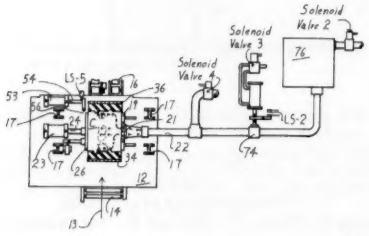
1. In apparatus for cleaning internal cavities in castings and the like wherein there is at least one opening into a side of the

casting communicating with at least one opening in the bottom of the casting,

a. a table on which the casting is placed, said table having an opening therethrough in communication with the bottom opening in the casting when in place on the table,

b. a stationary abutment against which the side of the casting having said opening therein is adapted to engage, there being an opening through the abutment in communication with the side opening in the casting when in place on the table,

c. a power driven clamp member opposite the abutment adapted to press the side of the casting having the opening therein against the abutment,



d. a movable casting positioning member disposed to be engaged by an end of the casting when it is moved onto the table, thus accurately to position the casting on the table relative to the direction of its movement thereonto,

e. a power driven hold down member adapted to lower onto and engage the top of the casting while in place on the table, and

f. means to force an airborne stream of abrasive material through the openings in the abutment thence into said side opening in the casting, into the casting cavities and out through the bottom casting and table opening, thus to clean said cavities.

3,869,831

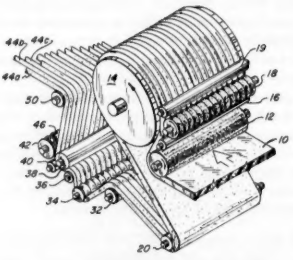
FLEXIBLE FOAM MATERIAL SHAPER

John F. Gibb, Englewood, Calif., assignor to Backer Rod Mfg. & Supply Co., Denver, Colo.

Filed Sept. 4, 1973, Ser. No. 393,827

Int. Cl. B24b *9/02*; **B29h** *7/18*

U.S. Cl. 51—75 **14 Claims**



1. Apparatus for shaping at least one surface of soft, flexible foamed sheet material, comprising:

a. at least one cylindrical drive roll means having a peripheral surface for passing an elongated sheet around and in contact with a substantial portion thereof,

b. cylindrical roll means juxtaposed with said drive roll means for compressing said sheet material against said drive roll means at about its first contact with said drive roll means,

c. a pair of closely spaced pinch roll means juxtaposed with said drive roll means adjacent to and downstream from said cylindrical roll means arranged for pressing said sheet material into contact with said drive roll means passing therebetween, and

d. high speed rotary cutter means juxtaposed with said drive roll means mounted between said pair of pinch roll means and rotating in the direction of travel of said sheet material arranged to shape said at least one side of said sheet material while it is in contact with said drum roll means, said rotary cutter means being shaped to provide corresponding cut in one surface of said sheet material.

3,869,832

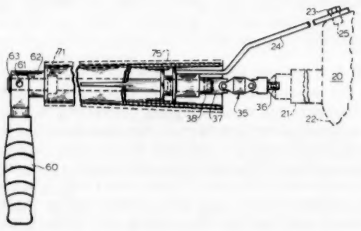
DRILL-OPERATED ABRADING TOOL

William M. Atwater, Pittsboro, N.C., assignor to Harriss-Conners Chevrolet, Inc., Chapel Hill, N.C.

Filed May 28, 1974, Ser. No. 474,131

Int. Cl. B24b *23/02*

U.S. Cl. 51—170 PT **1 Claim**



1. A portable abrading tool adapted to be removably secured to a hand electric drill of the type having a front housing, a chuck supported on the face of said housing, and a threaded aperture thereon for receiving a threaded fastener, said tool comprising, in combination:

a. a hollow elongated cylinder member having at least one slit in the wall thereof and extending for a major portion of the length thereof, having bearing surfaces within said cylinder member intermediate the length thereof and at oppositely disposed positions substantially radially removed from said slit, said bearing surfaces being adapted to receive a camming pressure for expanding said cylinder member, said cylinder member being open at one driven end and being closed at the opposite end by a wall having a central aperture;

b. a drive shaft centrally positioned within said cylinder member and extending from a driven end proximate said cylinder member open end to and through said cylinder member closed end and providing externally of said cylinder member closed end a handle mounting extension portion;

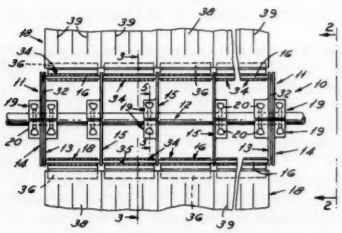
c. a bearing mounted on said drive shaft handle portion and having pivotally connected thereto an auxiliary handle and locking means secured to said drive shaft for retaining said handle bearing on said shaft;

d. a locking sleeve secured to said drive shaft internally of said cylinder member and proximate said end wall;

e. camming means secured to said drive shaft and disposed between said bearing surfaces, said camming means when rotated with respect to said bearing surfaces being operable in a first rotative position to contact said bearing surfaces and expand said cylinder member to tighten any abrading sleeve positioned thereon and in a second rotative position being movable out of contact with said bearing surfaces to allow said cylinder member to contract and said abrading sleeve to be removed;

f. a support bearing mounted internally of said cylinder member outwardly from said camming means and proximate said shaft driven end;
g. a bracket comprising a bent arm member having one end secured to said support bearing and the opposite end secured to a said drill housing by threaded fastener means mating with a said threaded fastening aperture on said housing;
h. a universal coupling means having at one end, a socket connection secured to said drive shaft driven end and at the opposite end to a spindle secured to a said drill chuck; and
i. an abrading sleeve having an appropriate length and internal diameter fitted on said cylinder member and adapted to be tightened thereon by rotation of said camming means against said bearing surfaces to said first rotative position and to be loosened for replacement by rotation of said camming means to said second rotative position.

3,869,833
ROTARY FINISHING WHEEL
James A. Belanger, 17505 Rexwood, Livonia, Mich. 48152
Filed Mar. 21, 1974, Ser. No. 453,316
Int. Cl. B24b *47/02*
U.S. Cl. 51—334 **7 Claims**

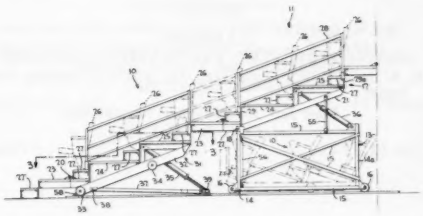


1. A rotary wheel structure to mount radially outer finishing units, comprising a series of axially spaced split opposite end and intermediate plate units each including two generally similar, semi-circular plates in substantial radial register and having means to releasably clamp the same coaxially in a partially surrounding relation to a drive shaft, there being two of said split end units adjacent each of the ends of said shaft, the axially inner end and intermediate plates of said plate units, as thus clamped, each having means spaced radially outwardly of the axis of said shaft for pivotally mounting said finishing units in circumferentially spaced relation to one another about said shaft axis.

3,869,834
COATED ABRASIVE ARTICLES HAVING A SURFACE DEPOSIT OF FLUOROCARBON PARTICLES
George Cruise Mullin, Reading; Robert Earle Wetherby, West Boxford, and Victor Oscar Chevalier, Tewksbury, all of Mass., assignors to Avco Corporation, Cincinnati, Ohio
Continuation-in-part of Ser. No. 672,992, Oct. 5, 1967, abandoned. This application Sept. 16, 1968, Ser. No. 762,315
Int. Cl. B24d *3/34*
U.S. Cl. 51—295 **8 Claims**

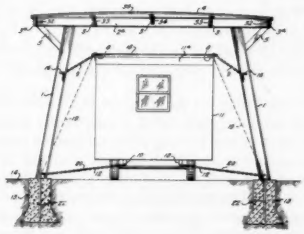
1. A coated abrasive device having a surface deposit comprising an accumulation of fluorocarbon particles covering at least that portion of the surface not covered by the abrasive particles and the ratio of the fluorocarbon to abrasive particles on the surface is ⅛ to ½ by weight.

3,869,835
DRAWER-TYPE GRANDSTAND ARRANGEMENT
Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004
Filed Feb. 15, 1974, Ser. No. 443,259
Int. Cl. E04h *3/12*
U.S. Cl. 52—9 **6 Claims**



1. A grandstand arrangement, comprising at least two seating sections disposed one behind the other with at least the forward section mounted on rollers for horizontal movement, the rearward section being supported on a structural framework having an open forward end, said rearward section further including a seating platform mounted at an inclination to the horizontal on said framework at the upper portion thereof, seats carried by said seating platform, said forward section including a seating platform and seats carried thereby, means for raising and lowering said forward section seating platform about the forward end thereof between a horizontal position and an angle having the same inclination as said rearward section seating platform, the height and width of said forward section in the horizontal position of its seating platform being less than the corresponding height and width of said structural framework, whereby said forward section is capable of being telescoped within said framework through its open end when said forward section seating platform is lowered into its horizontal position and is moved rearwardly thereinto.

3,869,836
MOBILE HOME PROTECTOR
Cloy L. Allen, Rt. 1, Box 1, Wingate, Tex. 79566
Filed Apr. 15, 1974, Ser. No. 460,880
Int. Cl. E04n *9/14*
U.S. Cl. 52—23 **11 Claims**



1. A mobile home protector including uprights, trusses connected to oppositely disposed uprights near the upper ends of the uprights, purlins supported by the trusses, plates for connecting the purlins to the trusses and supporting the purlins the desired elevation above the trusses, roofing material supported by the purlins and connected to the purlins so as to give the roof a pitch determined by the elevation of the purlins above the trusses, a bell shaped, reinforced concrete pier for each upright, means for connecting each upright to its associated pier, each pier being adapted for placement in the ground with the top of the pier at ground level, and means for bracing

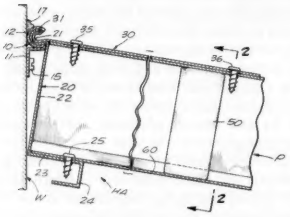
a mobile home roof said bracing means comprising chains, one chain connected to each upright below the level of the mobile home roof to be braced, adapters set on the side edge of the mobile home roof to be braced opposite each upright, and connecting elements wherein the free end of each chain not connected to the upright is locked in the adapter opposite said upright.

3,869,837

AWNING STRUCTURE, AND METHOD OF ASSEMBLY

R. S. Dunn, 200 S. Occidental, Apt. 201, Los Angeles, Calif. 90057

Filed July 23, 1973, Ser. No. 381,804
Int. Cl. E04b *1/344, 7/16*
U.S. Cl. 52—75 **6 Claims**



1. An awning structure attached to the wall of a pre-existing building comprising, in combination:

a mounting strip extending horizontally along the wall of the building, said mounting strip having a curved recess opening outwardly from the building;

means attaching said mounting strip to the building wall, and providing a water-proof seal between the mounting strip and the wall;

a plurality of generally trough-shaped pans arranged in a side-by-side relationship having the upper edges of their inner end approximately aligned with said recess of said mounting strip, and inclining outwardly and somewhat downwardly so that their outer ends may be supported by other means, the adjacent ones of said pans being joined together by means of overlapping and interlocking edges which provide an essentially water-proof joint between them;

and a hat assembly for securing the inner ends of said pans to said mounting strip, while concurrently permitting the upper ends of said pans to pivot relative to said mounting strip in response to wind pressure and the like without breaking said seal, said hat assembly including:

a. an elongated hanger having an arcuately curved flange received within said recess of said mounting strip, a flat portion extending downwardly from said flange to close the inner ends of said pan, and a lower flange bent outwardly from said main section of said hanger and secured to the bottom edges of the pans; and

b. an elongated flashing having an arcuately curved flange received within said flange of said hanger, said flashing having a flat portion extending over the upper edges of said pans whereby said hanger and said flashing together comprise a U-shaped box which encloses the upper ends of said pans and is capable of pivoting as a unit relative to said mounting strip;

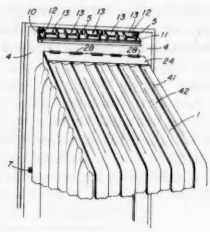
said hanger flange and said flashing flange forming a water-tight joint with said mounting strip.

3,869,838

WINDOW AWNING

George E. Tedesh, Pegan Ln., Dover, Mass. 02030

Filed July 2, 1973, Ser. No. 375,544
Int. Cl. E04b *1/34*
U.S. Cl. 52—76 **10 Claims**



1. An awning construction comprising:

a. a hanger comprising an elongated back plate adapted to be secured in a horizontal position on the upper portion of a window frame; said hanger having a substantially planar support member projecting outwardly and downwardly therefrom and forming an acute angle therewith; said support member being provided with a plurality of elongated slots extending through said support member along a position adjacent to and parallel with said back plate;

b. a suspension assembly having an elongated substantially planar suspension member provided with a plurality of elongated detents, corresponding in size and spacing with said slots, projecting from the upper surface of said suspension member, each of said detents being received in a corresponding slot, with the upper surface of said suspension member being substantially coplanar with the lower surface of said support member, and

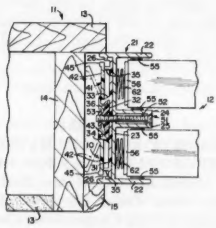
c. an awning roof portion secured along its upper end to said suspension assembly and projecting therefrom.

3,869,839

ADJUSTABLE WINDOW SEAT GUIDE

Waldo O. Johnson, Wooster, and Rodney P. Walters, Akron, both of Ohio, assignors to Louisiana-Pacific Corporation, Portland, Oreg.

Filed Oct. 26, 1973, Ser. No. 410,236
Int. Cl. E05d *13/02;* **E06b** *1/04*
U.S. Cl. 52—204 **4 Claims**



1. An adjustable window seat guide for side jamb liners including window positioning means and comprising:

a hinge section formed on a laterally outer portion of the side jamb liner and including converging laterally outwardly extending ribs,

a resilient member in juxtaposition to said hinge section and positioned between said ribs, a pair of arm members individually pivotally mounted on said ribs of said hinge

section and having corresponding end sections adjacent to and overlying said resilient member, and

an adjustable fastener having a securing member, said adjustable fastener engaging said side jamb liner with said securing member bearing against said arm ends so that adjustment of said fastener causes pivotal movement of said arm members.

3,869,840

DOOR JAMB LINER

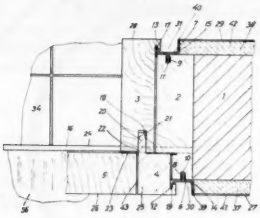
Helmut Hoffmann, Rudernstr. 4, and Walter Hoffmann, Bergstr. 18, both of Burgstall, Germany

Filed July 27, 1973, Ser. No. 383,119

Claims priority, application Germany, July 31, 1972, 2237625

Int. Cl. E06b *1/08, 1/32*

U.S. Cl. 52—211 **11 Claims**



1. A jamb-liner comprising a mounting frame secured to the edge of a plaster covered wall which is encased by a masking frame comprising pre-manufactured parts which are directly joined together through a tongue-and-groove system; there being moulded mounting strips at the vertical front faces of the mounting frame over which the parts of the masking frame are fitted from both sides, which parts are designed as continuous moulded strips which extend beyond the top of the mounting frame and down to floor level and which have a web which rests against the mounting frame and two legs one of which rests against the plaster with its edge flush with the wall surface while the other leg engages with a groove in the adjacent part of the masking frame.

3,869,841

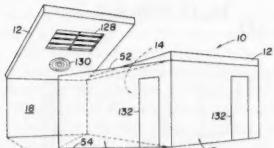
BUILDING CONSTRUCTION AND METHOD

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Salt Lake City, Utah

Division of Ser. No. 386,900, Aug. 9, 1973,. This application Aug. 21, 1974, Ser. No. 499,393

Int. Cl. E04b *1/344*

U.S. Cl. 52—745 **3 Claims**



1. A method of assembling interior rooms within a space, the steps of:

mounting a wall panel in a generally vertical orientation so as to fold into a compact configuration;

unfolding the wall panel to form an enclosure;

lowering a ceiling unit until the ceiling unit rests upon the unfolded wall panel; and

downwardly displacing the wall panel under the weight of the ceiling unit until a seal is formed simultaneously at the top and bottom of the wall panel.

3,869,842

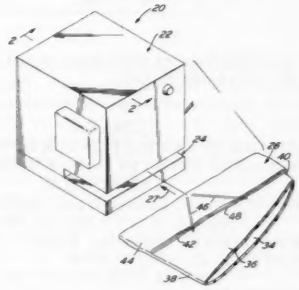
BAG SEALING APPARATUS AND METHOD OF USE

Henry Verbeke, Tannersbrook Rd., Chester, N.J. 07930

Filed Aug. 6, 1973, Ser. No. 385,922

Int. Cl. B31b *1/86*

U.S. Cl. 53—14 **16 Claims**



14. A method for sealing a plastic bag having an article disposed therein while forming a handle for said bag, said bag having a front and a rear wall and a flap folded against said rear wall comprising the steps of disposing the flap and the abutting rear wall under a heating means having a pair of angled elongated heating elements, automatically moving said heating means into contact with the mouth of said bag, and heating said heating means to form a pair of angled heat seals in the flap to seal the article therein by forming a pocket between the seals, which serves as a handle for the bag and thereafter automatically moving the heating means out of contact with the bag.

3,869,843

LIGHTWEIGHT PLASTIC CONTAINER CASE-PACKING METHOD AND APPARATUS

John W. Darrah, III, South Windsor, Conn., and Dick W. Williams, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 13, 1974, Ser. No. 450,557

Int. Cl. B65b *21/06, 35/54*

U.S. Cl. 53—26 **12 Claims**

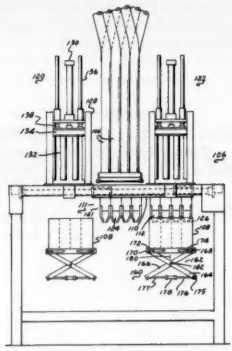
1. In a process for case-packing lightweight plastic containers which comprises:

A. receiving said containers in a plurality of rows of pockets in a packing frame adjacent the case; and then

B. simultaneously ejecting the containers from the rows into cells in the case;

the combination therewith of the steps of:

C. accumulating the containers in end to end relationship in tubes above said packing frame; and



D. cyclically releasing single layers of said containers from the tubes to the pockets.

3,869,844

METHODS OF AND DEVICES FOR CONTINUOUSLY PACKAGING ARTICLES IN THERMOSHRINKABLE PLASTICS FILM

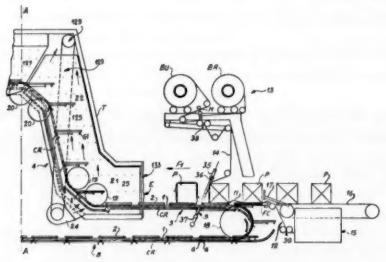
Pierre Paul Edouard, Essonne, France, assignor to Lara S.A.

Filed Aug. 31, 1973, Ser. No. 393,481

Claims priority, application France, Sept. 4, 1972, 72.31291; Sept. 25, 1972, 72.33890

Int. Cl. B65b *53/06, 11/50*

U.S. Cl. 53—30 **20 Claims**



1. A method for continuously packaging collections of articles in a wrapping of thermoshrinkable plastics film, utilizing a conveyor moving continuously and carrying the unwrapped collections of articles uninterruptedly one after another and delivering them, wrapped and closed and ready to be handled, comprising the steps of:

depositing collections of articles in spaced succession upon a lower film of heat sealable material at a feed station;

covering of the collections with an upper film of said material;

heat sealing the upper film to the lower film between each adjacent pair of collections and cutting each heat sealed joint in half to provide a series of loosely wrapped collections of articles;

transporting said series of loosely wrapped collections of articles sequentially through a preheating zone, then through a thermoshrinkage zone along an upwardly directed path, then through a thermoshrinkage finishing zone and, finally, through a cooling zone along a downwardly directed path to a discharge station where the collections, wrapped tightly and closed, may be immediately handled.

3,869,845

UPCOILER FOR COILING A PLURALITY OF STRIPS

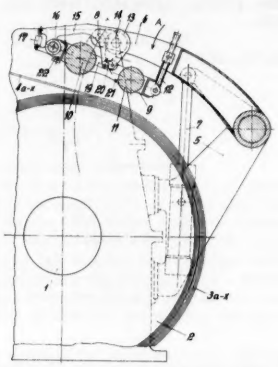
Alexander Rodach, Pforzheim, and Hans Weber, Engels Brand, both of Germany, assignros to Frau Irma Ungerer, Pforzheim, West Germany

Filed Mar. 11, 1975, Ser. No. 343,789

Claims priority, application Germany, Nov. 18, 1972, 2256730

Int. Cl. B65b *61/00*

U.S. Cl. 53—137 **6 Claims**



1. A winding device for coiling a strap comprising a rotatable drum for receiving said strap, a first pressure roller engageable with said strap to force the final convolution of coiled strap against the coil on the drum, a dispenser of adhesive tape engageable with said strap and disposed behind said first pressure roller to dispense adhesive tape onto the coiled strap, a second pressure roller engageable with said strap and disposed behind said dispenser for applying pressure to the coiled strap, a primary pivoted lever disposed in relative position to said drum and movable to positions toward and away from said drum, an actuating cylinder for moving said primary pivoted lever, a secondary pivoted lever connected pivotally to the free end of said primary pivoted lever and adapted to carry said first pressure roller and said second pressure roller.

3,869,846

FOLDING DEVICE FOR PACKAGING MACHINES

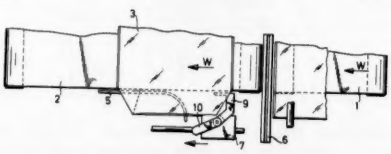
Karl-Ernst Timmerbeil, Ennepetal, Germany, assignor to Firma Packautomatic GmbH & Co. K.G., Ennepetal, Germany

Filed Aug. 1, 1973, Ser. No. 384,756

Claims priority, application Germany, Aug. 2, 1972, 2237948

Int. Cl. B65b *9/12, 7/04*

U.S. Cl. 53—182 **2 Claims**



1. In a packaging machine for wrapping articles in a foil, the combination which comprises:

transport means for feeding said articles along a path;

means for feeding a lower foil along the underside of said article and an upper foil along the upper side of said

article with said foils laterally overhanging ends of the article;

means for sealing said foils together, thereby forming a sleeve with the overhanging portions of the foil including a vertical front portion, a horizontal upper portion and a vertical rear portion;

a fixed first folding finger disposed along said path and engageable with the vertical front portion of a sleeve wrapped around an article displaced along said path for folding said vertical front portion inwardly against the latter article;

a shaft disposed alongside said path and rotatable about an axis perpendicular to the direction of feed of said articles; a supporting finger mounted on said shaft and swingable thereby into a position underlying said horizontal upper portion of said sleeve for supporting said horizontal upper portion against sagging; and

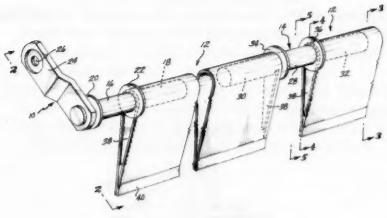
a second folding finger mounted on said shaft below said support finger and angularly offset therefrom which swings by said shaft into engagement with said rear vertical portion to fold the same inwardly against the article into a space maintained by the support of said horizontal upper portion by said support.

3,869,847

BAT CONSTRUCTION FOR A HARVESTER REEL

Donald L. May, Garfield, Wash., assignor to J. E. Love Company, Garfield, Wash.

Filed Jan. 22, 1974, Ser. No. 435,530
Int. Cl. A01d *57/02*
U.S. Cl. 56—220 **4 Claims**



1. A harvester reel bat comprising:

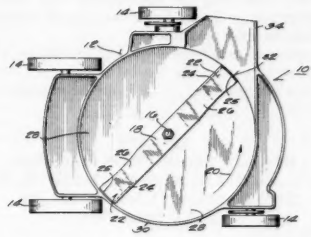
a plurality of tubular bat blade sections, a plurality of journal sections disposed between and interconnecting said bat blade sections, and crank sections disposed at each end of said bat, said crank and journal sections having journal portions thereon, and each said crank section having a crank arm portion situated endwise outwardly of its journal portion with said journal portion having end thrust members engaged therearound and an inner end pin portion projecting into the adjacent outer bat blade section, and each said journal section having a central journal portion with end thrust members engaged therearound, and end pin portions projecting into the opposite ends of the adjacent tubular bat blade sections to interconnect said adjacent bat blade sections, there being a relatively thin support brace plate located within each outermost end of each bat section depending endwise downwardly from the projecting end pin portion into the hollow bat blade section, said support brace plate being permanently mounted along its edges to the projecting end pin portion and the interior sides of the hollow bat blade section to prevent said brace plate from moving relative to said bat blade section when said harvester reel bat is torqued.

3,869,848

ROTARY MOWER HAVING QUIET CUTTER BLADE

Robert T. Larsen, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed July 18, 1973, Ser. No. 380,294
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **7 Claims**



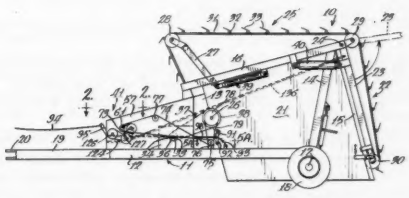
1. A rotary mower comprising a blade housing including a top deck, a plurality of ground-engaging wheels mounted on said blade housing for supporting said blade housing for travel in spaced relation above the ground, a generally vertically extending, annular wall depending from said top deck, a generally flat and elongated cutter blade supported by said housing for rotary movement through a horizontal plane within said housing, diametrically opposed tip portions on said cutter blade each having an outer radial extremity which terminates in closely spaced relationship to said annular wall, each of said tip portions including a leading cutting edge extending radially inwardly from said outer extremity, a trailing edge extending radially inwardly from said outer extremity rearwardly of said leading cutting edge, and an upstanding vane extending forwardly from said trailing edge and having a radially outermost portion spaced radially inwardly a predetermined distance from said outer extremity so as to provide a generally flat section therebetween.

3,869,849

GROUND ENGAGING HAY BALE ROLLING APPARATUS

James K. Ulrich, Vinton, Iowa, assignor to Starline, Inc., Harvard, Ill.

Filed Aug. 2, 1973, Ser. No. 384,954
Int. Cl. A01d *39/00*
U.S. Cl. 56—343 **12 Claims**



3. Apparatus for rolling a swath of hay into a twine wrapped bale in contact with the ground comprising, in combination:

a wheeled frame defining a baling chamber;

driven means mounted on said frame in association with said baling chamber for contacting hay in a swath and compressing and rolling the hay forwardly on itself to form a spiral bale as the apparatus moves forwardly along the swath, said driven means being operable independently of the movement of the apparatus;

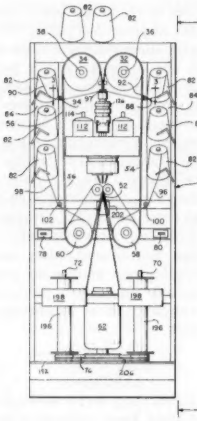
a twine supply, supported in the frame;
twine feeding roller means journalled at the front of the frame;
means for driving said roller means to feed a strand of twine from said supply and to lay said strand along the line of the swath immediately forward of the forming bale as the apparatus moves forwardly, whereby said strand may be wound in the convolutions of the bale;
means for controlling the operation of said roller driving means to initiate the feeding of said strand of twine during the bale forming operation;
means operable to cut the twine and to substantially simultaneously terminate the feeding of twine;
and means for releasing a bale from the chamber.

3,869,850

CHENILLE PRODUCTION MACHINES

Alexander Gross, 2590 W. Maple Ave., Feasterville, Pa. 19047

Filed Jan. 18, 1973, Ser. No. 324,566
Int. Cl. D02g *3/42*
U.S. Cl. 57—24 **5 Claims**



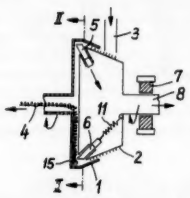
1. In a chenillle production machine of the type including a frame, the combination of
A. a flyer mounted on the frame and having rotary motion with respect to the frame,
1. said flyer including a floor,
2. said flyer being concentrically positioned about a hollow spindle;
B. an endless steel band rotating about the frame and passing through the hollow interior of the flyer spindle,
1. said band rotating about an upper pulley and a lower pulley,
a. the lower pulley being provided with a peripheral groove and wherein an outside warp thread loops about the periphery of the lower pulley and is positioned within the groove to synchronize the speed of feeding the outside warp thread with the speed of feeding the inside warp thread,
C. filler yarn studs carried by the flyer,
1. said filler yarn studs being rotated in a horizontal plane relative to the frame,
2. the filler yarn studs having no motion relative to the flyer itself,
3. the filler yarn studs projecting upwardly from the flyer floor,
4. the filler yarn studs each being provided with an axial bore,
5. the flyer floor being provided with openings in vertical alignment below each said axial bore;
D. inside and outside warp thread cones positioned on the frame and having no motion relative to the frame,
1. the inside warp thread cones feeding inside warp threads to the steel band and downwardly through the hollow interior of the flyer spindle,
2. the outside warp thread cones feeding outside warp threads to the steel band below the flyer;
E. a filler yarn spool removably carried upon a filler yarn stud and feeding filler yarn to the steel band,
1. said filler yarn passing downwardly through the axial bore and aligned flyer floor opening,
2. said filler yarn being wrapped about the steel band below the flyer by the rotation of the flyer;
F. a cutter blade mounted on the frame below the flyer,
1. said cutter blade reciprocating near a portion of the steel band to sever wrapped filler yarns to form chenille yarn; and
G. a finished yarn bobbin mounted for rotary action relative to the frame,
1. said finished yarn bobbin receiving and winding the chenille yarn.

3,869,851

CLEANING OF OPEN-END SPINNING TURBINES

Peter Muller, Bremen-Lesum, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 14, 1974, Ser. No. 442,320
Claims priority, application Germany, Feb. 14, 1973, 2307121
Int. Cl. D01h *11/00, 7/00*
U.S. Cl. 57—58.89 **4 Claims**

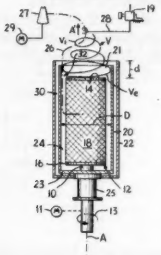


2. In a yarn forming machine composed of an open-end spinning turbine presenting a fiber collection trough, a breakup roller mounted for rotation in, and coaxially with, the turbine, and means for extracting air from the region enclosed by the roller, the improvement comprising: guide means carried by said roller in a region adjacent, and enclosed by, the periphery thereof and defining at least one travel path extending substantially tangentially to the portion of said roller periphery adjacent thereto; and means defining at least one air extraction channel extending between the region outside and the region enclosed by said roller, said channel means being mounted in said guide means for movement, under the influence of mass inertia, along such path in the direction toward the region outside said roller when said roller decelerates, for temporarily bringing one end of said extraction channel into the vicinity of said fiber collection trough.

3,869,852
METHOD OF AND APPARATUS FOR TWISTING YARN

Edmund Hamel, Romanshorn, Switzerland, assignor to Die Evolution S.A., Rorschach, St. Gallen, Switzerland

Filed Feb. 22, 1974, Ser. No. 444,714
Claims priority, application Germany, Feb. 28, 1973, 2310002; Nov. 5, 1973, 2355193
Int. Cl. D01h 7/00
U.S. Cl. 57—59 18 Claims



5. An apparatus for twisting a yarn comprising:

a spindle having a longitudinal axis and adapted to receive a yarn bobbin;

a tube concentric with said axis and fixed on said spindle, said tube defining an axially extending space with said bobbin and having an axially open end projecting beyond said bobbin;

means for rotating said spindle, said bobbin, and said tube about said axis and thereby generating a vortex of air at said open end of said tube and having a velocity decreasing axially away from said package;

an eye axially spaced from said bobbin at said open end; and

means for pulling a yarn off said bobbin and through said eye and guiding said yarn through said vortex to form a balloon thereof in said space and in said vortex.

3,869,853
FRICTION BUSH

Werner Doschko, Nussloch am Leimbach; Wolfgang Fohlisch, Nussloch, and Alfred Wensch, Bad-Mingolsheim, all of Germany, assignors to Imperial Chemical Industries Limited, London, England

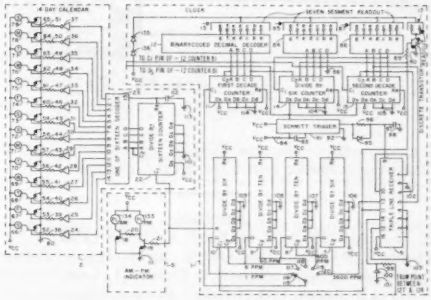
Filed Mar. 2, 1973, Ser. No. 337,336
Claims priority, application Great Britain, Mar. 7, 1972, 10498/72
Int. Cl. D02g 1/04
U.S. Cl. 57—77.4 9 Claims

1. A friction bush for imparting twist to a moving yarn comprising a rotatable rigid metal portion shaped to provide an area for contact with the yarn said metal portion being coated over at least that part of its surface which contacts the yarn with a layer of frictional material no more than 2 millimetres thick, said friction material having a shore hardness at room temperature greater than 30.

3,869,854
SOLID STATE ELECTRONIC CONTROL

James A. Church, 3570 Cortez, Dallas, Tex. 75220

Filed May 10, 1973, Ser. No. 359,188
Int. Cl. G04c 13/06, 23/12; E03b 7/07
U.S. Cl. 58—33 36 Claims



1. A solid state electronic control for timing and cycling including integrated circuits for timing and frequency division, discrete transistors, solid state diodes, light emitting diode numeric indicators, resistors and capacitors, and an internal power supply including an alternating current source wherein the integrated circuits drive the discrete transistors to control the light emitting diode numeric indicators for time indication, the solid state diode rectify alternating current from the alternating current source to direct current, the resistors limit current, and the capacitors effect filtering and transient suppression to automatically, sequentially time and cycle the actuation of electrically operated remote control valves for distribution of water for the purpose of irrigation, spraying, and humidification of plant materials, said solid state electronic control comprising six sections including a digital readout clock circuit, a calendar circuit, an hours memory circuit, a station output board, the internal power supply, and an external power output circuit in which the digital readout clock circuit is connected to the calendar circuit, the hours memory circuit, and the internal power supply, the station output board is connected to the calendar circuit, the hours memory circuit, and the digital readout clock circuit, and the external power output circuit is connected to the station output board and adapted for connection to remote control valves so that the digital readout clock circuit indicates the hours of a time period and then repeats, the calendar circuit changes indication each 24 hours, indicating days of the week, the hours memory circuit tracks the digital readout, the internal power supply is common to all sections of the control except power output to remote control valves, startup of the station output board is dependent on coincidence of signals obtained from the digital readout clock circuit, the calendar circuit, and the hours memory circuit, and the external power output circuit supplies power to operate remote control valves.

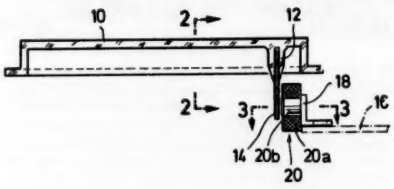
3,869,855
ACOUSTICAL SOUND PRODUCER FOR CLOCKS, ESPECIALLY FOR WRISTWATCHES

Walter E. Sodler, Buchenbronn, Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed June 17, 1974, Ser. No. 479,943
Claims priority, application Germany, July 5, 1973, 2334236
Int. Cl. G04b 23/12; G04c 21/34; G10k 9/00
U.S. Cl. 58—57.5 3 Claims

1. An acoustical sound producer for clocks, especially for wristwatches, comprising a watch crystal, an electromagnet

system adapted to be excited by an oscillator, and a pin attached to the watch crystal, said pin being at least partially of



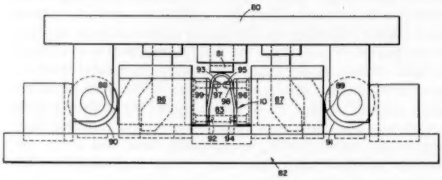
ferromagnetic or magnetic material and extending into the alternating magnetic system for direct excitation.

3,869,856

METHOD OF MAKING A CHAIN LINK

Claude L. Wildman, Thomson, Ill., and George A. Hellmer, Maquoketa, Iowa, assignors to Richard A. Kummerer and Alfred D. Besten, both of Fulton, Ill., part interest to each

Filed Apr. 4, 1974, Ser. No. 457,802
Int. Cl. B21l *11/06*
U.S. Cl. 59—8 **9 Claims**



1. A method of making a pintle chain link from a U-shaped metal strap in which the closed end is looped; providing an abutment at said closed end for forming an arcuate-shaped end at said closed end; gripping said sides of said U-shaped strap, and while gripping the sides compressing the loop end against the abutment to form the arcuate-shaped end and forcing excess material of the loop end into the sides adjacent the closed end.

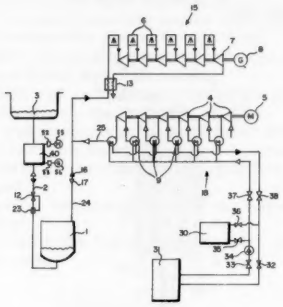
3,869,857

THERMAL POWER PLANT

Peter Heinrich Erwin Margen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Feb. 1, 1973, Ser. No. 328,688
Int. Cl. F02b *21/00*
U.S. Cl. 60—39.18 R **10 Claims**

1. A thermal power plant comprising a gas turbine, an electric generator driven by said gas turbine, a compressor arranged to generate compressed air, a compressed air magazine arranged to receive compressed air from said compressor and to deliver the compressed air to said gas turbine, a water reservoir having its lower end located at a considerably higher level than the upper end of said compressed air magazine, and a water conduit extending between said water reservoir and said compressed air magazine in direct contact with the water in said reservoir and providing a passage through which the water is led from said water reservoir to said compressed air magazine while said magazine is being discharged and is led to the opposite direction while said magazine is being charged, wherein the improvement comprises that said compressed air magazine comprises an enclosed below-ground level rock chamber arranged for the storage of compressed air at a pressure at least twice as high as the static pressure corresponding to the difference in level between the rock chamber and the water reservoir, said water conduit forming a closed passage extending downwardly from its upper end connected to said reservoir below the water level therein to its lower end connected to the lower end of said compressed air magazine, means for pressurizing the water in said water conduit to a pressure at least twice that of the static pressure head acting on said compressed air magazine through the water in said



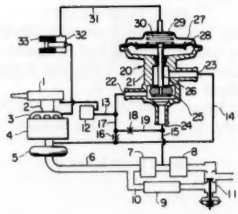
conduit due to the difference in level between the water level in said reservoir and the bottom of said compressed air magazine, said means comprises a pump located in said water conduit intermediate the ends thereof below said water reservoir and above said compressed air magazine for pressurizing the water in said conduit communicating with said compressed air magazine.

3,869,858

EXHAUST GAS PURIFYING SYSTEM FOR MOTOR VEHICLES

Kenji Goto; Ryozo Mitsui, and Norikatsu Ishikawa, all of Shizuoka-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Filed July 23, 1973, Ser. No. 381,446
Claims priority, application Japan, Aug. 23, 1972, 47-83620
Int. Cl. F02b *75/10*; **F01n** *3/14*, *3/16*
U.S. Cl. 60—290 **5 Claims**



1. An exhaust gas purifying system for motor vehicle engines comprising an exhaust conduit, a reducing-catalyst converter and an oxidizing-catalyst converter installed in said exhaust conduit, an air pump for supplying secondary air, a flow control valve receiving secondary air flow from said air pump, said flow control valve having a first and a second discharge outlet, a first conduit between said first discharge outlet and a point of said exhaust conduit upstream of said reducing-catalyst converter, a second conduit means between said second discharge outlet and a point of said exhaust conduit between said reducing-catalyst converter and said oxidizing-catalyst converter, control means for controlling said flow control valve depending on the operating condition of said engine to control the amount of secondary air passing through said first and second conduit means, a first by-pass conduit means by-passing said control valve and providing communi-

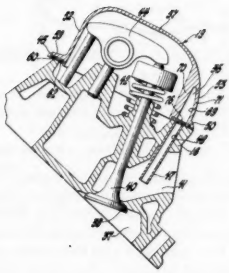
cation between said air pump and a point of said exhaust conduit upstream of said reducing-catalyst converter, and a second by-pass conduit means by-passing said control valve and providing communication between said air pump at a point of said exhaust conduit between said reducing-catalyst converter and said oxidizing-catalyst converter.

3,869,859

ENGINE AND VALVE COVER THEREFOR HAVING INTEGRAL AIR GALLERY

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1974, Ser. No. 434,230
Int. Cl. F02b *75/10*
U.S. Cl. 60—305 **7 Claims**



1. An internal combustion engine of the type having a system for supplying secondary air to the exhaust ports for reaction with combustibles in the exhaust gases, said engine comprising

a cylinder block having a plurality of cylinders longitudinally aligned in a bank,

a cylinder head closing the outer ends of said cylinders and defining therewith combustion chambers at the ends thereof, exhaust ports in said cylinder head and connecting with said combustion chambers and exhaust valve means carried in said cylinder head and operable to control communication of said combustion chambers with said exhaust ports, said cylinder head having a peripheral valve cover mounting surface and a plurality of secondary air passages in said head extending between said exhaust ports and said valve cover mounting surface for directing secondary air to said ports, and

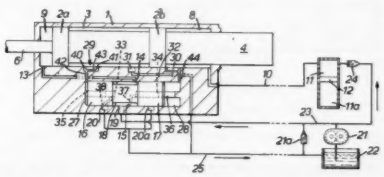
a cylinder head cover secured on said cover mounting surface to enclose portions of said valve means, said cover having a side wall one edge of which sealingly engages said mounting surface, said side wall having a longitudinal recess formed therein open along said edge, said recess forming a gallery registering with said cylinder head secondary air passages and closed by the sealing engagement of said side wall with said mounting surface, and means in said cover for connecting said recess with a source of secondary air.

3,869,860

FLUID FLOW CONTROL VALVES

Peter Duckworth, Coventry, England, assignor to Keelavite Hydraulics Limited, Warwickshire, England

Filed Jan. 2, 1974, Ser. No. 430,086
Claims priority, application Great Britain, Dec. 29, 1972, 60064/72
Int. Cl. F15b *1/02*; **F16k** *11/07*
U.S. Cl. 60—371 **7 Claims**



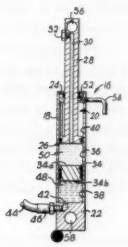
1. In a fluid flow control valve having a piston having a land arranged to move past port means in the cylinder wall, the improvement which comprises said port means having a dimension in the axial direction which is greater than its dimension in the circumferential direction.

3,869,861

COMBINATION HYDRAULIC CYLINDER AND ACCUMULATOR

Cecil L. Case, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Oct. 15, 1973, Ser. No. 406,228
Int. Cl. F15b *1/02*
U.S. Cl. 60—413 **7 Claims**



1. A combination accumulator and pressure-actuated power unit comprising:

a hollow cylinder having a working chamber therewithin and adapted for connection to one of two relatively shiftable structures;

a first piston within said chamber and dividing the latter into a pair of subchanbers on opposite sides of said piston;

a compressible fluid in one of said subchambers filling the same;

means for introducing a noncompressible fluid into the other of said subchambers; and

a second imperforate piston reciprocable within said chamber and adapted for connection to the other of said relatively shiftable structures,

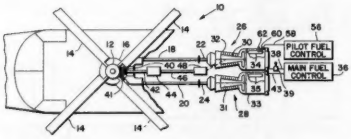
said first piston being free-floating within said chamber whereby to permit cushioning of said structures against said compressible fluid when a fixed volume of said noncompressible fluid is maintained, yet to permit powered relative shifting of the structures when the volume of said noncompressible fluid is varied,

said second piston being reciprocable within said one subchamber against said compressible fluid.

3,869,862
FUEL CONSERVATION SYSTEM FOR MULTI-ENGINE POWERED VEHICLE

Thomas A. Dickey, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Dec. 1, 1972, Ser. No. 311,226
Int. Cl. F02c *7/02*
U.S. Cl. 60—39.15 **10 Claims**



1. A fuel conservation system for a vehicle having a wide range of power requirements and normally powered simultaneously in the same direction by at least first and second gas turbine engines, each having a compressor rotor rotatable to pressurize air, a combustor receiving air from said compressor rotor and means for supplying metered fuel to said combustor, thereby enabling combustion and production of a motive gas stream, said engines being operable over relatively wide power ranges, said system comprising:

means for selectively terminating metered flow of fuel to the combustor of said first engine;

means connected to and deriving power from the second gas turbine engine for driving the compressor rotor of the first engine at an idle R.P.M. substantially below its normal operating R.P.M.;

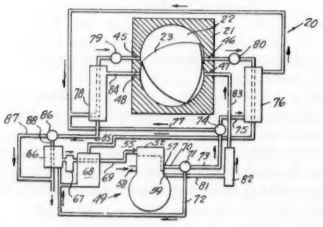
means for sustaining pilot combustion in a portion of the combustor of said first engine;

whereby fuel consumption is significantly reduced during low vehicle power requirements and said first engine is in a state of readiness for rapid establishment of full power.

3,869,863
ROTARY STEAM VAPOR AND EXTERNAL COMBUSTION ENGINE

Mark A. Juge, 8591 Willing Way, Fair Oaks, Calif. 95628

Continuation-in-part of Ser. No. 343,964, March 22, 1973. This application July 26, 1973, Ser. No. 382,773
Int. Cl. F01k *25/06*
U.S. Cl. 60—39.19 **1 Claim**

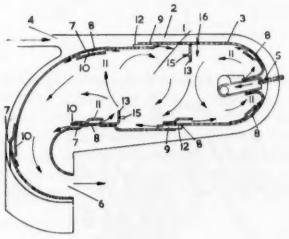


1. In a rotary steam vapor and hot gas powered engine system, a housing having a substantially triangular rotor mounted therein, a shaft extending through said housing, said rotor and shaft being geared directly to each other whereby a variety of ratios are permitted between the shaft and rotor, means for feeding steam vapor to one side of said rotor to drive said rotor, means for simultaneously feeding products of combustion to another side of said rotor to drive said rotor, a steam generator for producing steam that is fed to said rotor, means including a combustion chamber for producing hot gases for feeding to another side of said rotor, means for conducting the hot gases from said last named means to said steam generator, said engine system utilizing two different fluids simultaneously within the housing, said combustion chamber being chargeable at a pressure that is much lower than the operating pressure in the engine, and a valve means located in said combustion products feeding means, which is openable at the time of ignition in said combustion chamber to permit selective explosion of a charge.

3,869,864
COMBUSTION CHAMBERS FOR GAS TURBINE ENGINES

George Edward Bunn, Clitheroe, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed June 11, 1973, Ser. No. 368,576
Claims priority, application Great Britain, Sept. 6, 1972, 27154/72
Int. Cl. F02c *7/18*
U.S. Cl. 60—39.65 **4 Claims**



1. A combustion chamber for a gas turbine engine, comprising a flame tube, an air supply passage separated from said flame tube by a wall thereof, means defining a plurality of apertures in said wall providing communication between said air supply passage and the interior of said flame tube, each of said apertures being adapted to cause a flow of air along said wall within said flame tube, baffles projecting from said wall within said flame tube for deflecting air passed, in use, along said wall from at least some of said apertures, and projections spaced from said wall and extending from said baffles in a direction transverse to the direction of extent of said baffles whereby circulation of gas, in use, is established and maintained in the desired flow pattern.

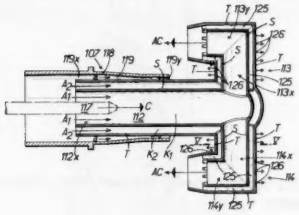
3,869,865
DEVICES FOR PREVAPORISING LIQUID FUEL

Armand Jean-Baptiste Lacroix, Itteville; Herve Alain Quillevere, Issy-les-Moulineaux; Bernard Andre Cantaloube, Chennevieres, and Jacques Emile Jules Caruel, Dammarie les Lys, all of France, assignors to Societe National D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed June 22, 1973, Ser. No. 372,514
Claims priority, application France, June 23, 1972, 72.22811
Int. Cl. F02c *7/18, 7/22*
U.S. Cl. 60—39.66 **6 Claims**

1. A device for prevaporising liquid fuel, designed for fitting to a combustion system comprising a combustion chamber, a source of liquid fuel and a source of gaseous comburrent agent, said device being of the kind which comprises, projecting into the combustion chamber, a hollow structure incorporating a body and at least one arm attached to said body and having at least one portion extending transversely of the general direction of said body, the latter comprising an entry portion which communicates with said sources of liquid fuel and gaseous comburrent agent, and said arm having an exit portion which opens into the combustion chamber and through which, in operation, there is discharged a mixture of

gaseous comburrent agent and at least partially vaporised fuel, in which said hollow structure comprises, in a zone which incorporates the transverse portion of said arm, a double-walled system comprising an internal wall and an external wall



which together delimit two separate passages, namely a central passage communicating both with the source of gaseous comburrent agent and with the liquid fuel source, and a peripheral passage communicating solely with the source of gaseous comburrent agent.

3,869,866

INTERNAL COMBUSTION ENGINE TURBOCHARGER DRIVES AND CONTROLS

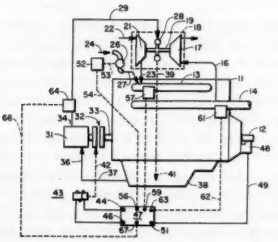
Seamus G. Timoney, Dublin, Ireland, assignor to Tectonics Research Ireland Limited, Dublin, Ireland

Filed Mar. 27, 1973, Ser. No. 345,269

Claims priority, application Great Britain, Mar. 30, 1972, 14927/72

Int. Cl. F02b *37/04*

U.S. Cl. 60—607 **4 Claims**



1. Apparatus for controlling the supply of energy to an exhaust gas turbocharger for a turbocharged engine in which the turbocharger includes a compressor fixedly connected to an exhaust gas turbine driven by exhaust gases from the engine, and in which the engine has a rotary output shaft, said apparatus comprising an auxiliary hydraulic turbine fixedly connected to said exhaust gas turbine and compressor and having an inlet for pressurized fluid to drive the auxiliary turbine, a fixed displacement hydraulic pump having an outlet connected to said inlet to deliver pressurized fluid to the auxiliary turbine, said pump also having an inlet adapted for connection to a liquid reservoir from which said pump receives liquid for high pressure liquid delivery through the pump outlet to drive the auxiliary turbine, and a clutch member having connecting and disconnecting positions for selectively connecting and disconnecting the pump to and from such rotary output shaft of the engine.

3,869,867

CASING ELEMENT FOR EXCAVATION CASING

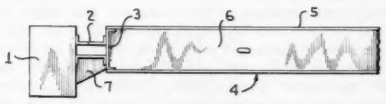
Josef Krings, D5138 Oberbruch, Germany

Filed Aug. 10, 1972, Ser. No. 279,302

Claims priority, application Germany, Sept. 29, 1972, 7136851

Int. Cl. E21d *5/06*

U.S. Cl. 61—41 A **1 Claim**



1. A new article of manufacture comprising a casing element for excavation casing including a frame formed of shaped structural members of a class including channel members, and filling comprising a plurality of spacers extending between and rigidly secured to said frame structural members, said spacers being in the form of shaped elements, and a pair of metal sheets mounted on both sides of said frame and having disposed therebetween said spacers, the casing element being improved by the securement of said sheets to said frame and said spacers solely by a plurality of spot welds which render the casing element free of distortions due to thermal stresses, at least one edge of said frame having a post member secured thereto in spaced relation by means of connecting members, the connection between said frame and said post member being reinforced against movement of said casing element from a generally planar state, said connection between said post and said frame including further structural members extending generally coextensive with said post and rigidly secured to both said post and said frame, said structural members being spaced transversely of said posts and generally within the thickness of said frame, and there being reinforcing elements spaced along the length of said post and lying in transverse planes, said reinforcing elements being rigidly secured to said post, at least one of said further structural members and said frame.

3,869,868

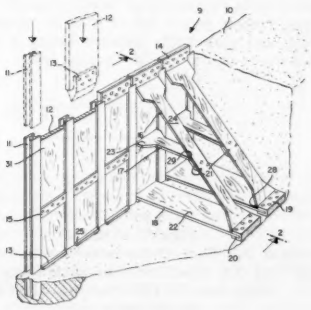
RETAINING WALL SUPPORT DEVICE

Eugene Irsai, 163 Greenway South, Forest Hills, N.Y. 11375

Filed Dec. 27, 1973, Ser. No. 428,815

Int. Cl. E02b *3/14*; **E02d** *11/00*

U.S. Cl. 61—49 **4 Claims**



1. A retaining wall device comprising in combination: a series of stake guide elements each of elongated shape axially longitudinally upright having a lower end thereof extending a predetermined depth below earth level into which the stake guide element is sunk, the upright elements of the series being parallel to one-another and consecutively spaced apart in the

series each a predetermined spacing distance from adjacent stake guide elements of the series; a plurality of separate baffle elements each of longitudinally axially elongated shape having its longitudinal axis upright and defining opposite lateral edges extending uprightly each of predetermined shape flushly meshable with one of two opposite upright side edges of an adjacent one of the upright elements with which the baffle elements are interspersed, and including locking structure means such that the meshed lateral edges are fixedly locked to respective meshed upright elements' side edges secure against forward and backward movements from alignment between serially arranged stake guide elements on either side of respective baffle elements, and locked securely against axial movement longitudinally; earth-weight anchoring-support means comprising for each consecutive pair of adjacent stake guide element and baffle element a substantially horizontal means defining a broad upper face having a substantially wide predetermined width and a substantially long predetermined length anchored at one end thereof attached to said baffle element at a lower end portion of the baffle element at a back-side face of the baffle element such that the horizontal means extends substantially horizontally rearwardly, and an inclined bracing element axially longitudinally elongated secured fixedly to a rearward end portion of the horizontal means at one end of the bracing element and the remaining end of the bracing element being secured fixedly to an upper end portion of said baffle element, said predetermined width and said predetermined length being sufficiently large for fill-material placed thereon to anchor the baffle element against a base of the baffle element pivoting outwardly; and fill-material being filled on top of the upper face at a fill-material predetermined height sufficient for the mass thereof to anchor the bracing element against said pivoting outwardly as a result of movement by torque forces against forward faces of the stake guide elements and baffle elements, each stake guide element defining on each of opposite lateral upright faces an upright groove, and in which the groove opposite lateral edges of each baffle are shaped to have a cross-section such that the baffle element is axially slidable downwardly between spaced-apart stake guide elements within opposing grooves of the adjacent stake guide elements before being anchored fixedly by said fill-material, said horizontal means being fixedly anchored to a lower end portion of the baffle element with the inclined bracing element secured at an upper end of the baffle element fixedly to a rearward face of an upper portion of the baffle element to which the attached horizontal means is fixedly secured, each baffle element having a substantially flat forward face and an opposite substantially flat rearward face; and lock means for fixedly mounting the earth-weight anchoring-support means to its respective baffle element, there being a separate earth-weight anchoring-support means for each of the respective baffle elements, and each baffle element having a downwardly-directed wedge-shaped bottom terminal end.

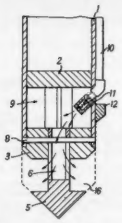
3,869,869

PILING SYSTEM

Paul Chuan Pao Chen, 3 Barbecue Garden, 17 Milestone, Castle Peak Rd., New Territories, Hong Kong

Filed Nov. 26, 1973, Ser. No. 419,199
Int. Cl. E02d *5/36*
U.S. Cl. 61—53.64 **7 Claims**

1. Apparatus for casting a subterranean concrete pile, said apparatus comprising a tube for sinking into a ground formation in which the pile is to be cast, an immovable sealing member extending internally across the tube at a position adjacent one end thereof and adapted to receive hammer blows of a pile driver, a releasable end plug for closing said one end of the tube to form a chamber for receiving cement-sand grout and conduit means positioned externally of the



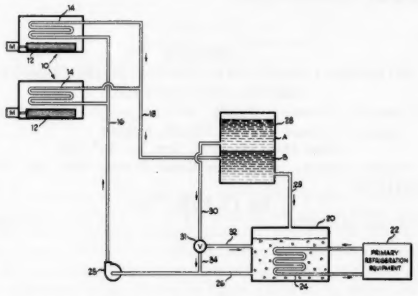
tube for passing the grout under pressure from ground surface into the chamber.

3,869,870

REFRIGERATION SYSTEM UTILIZING ICE SLURRIES

Richard Kuehner, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 2, 1973, Ser. No. 375,991
Int. Cl. F25b *23/00*
U.S. Cl. 62—114 **9 Claims**



1. A system comprising a first substance capable of existing in both liquid and solid phases and having a freezing point below about 60°F.; a second substance capable of existing in both liquid and solid phases and having a freezing point substantially below the freezing point of said first substance and being immiscible with said first substance when both are in the liquid phase; means for chilling said first substance to a temperature below its freezing point to effect a change of state from liquid to solid; means for mixing the resulting solid first substance with said second substance in liquid phase; means for circulating the resulting mixture to a refrigeration load to abstract heat therefrom by the change of state from solid to liquid of said first substance; and means for separating said first and second substances.

3,869,871

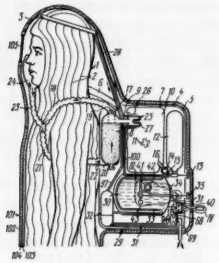
GAS AND HEAT PROTECTIVE GARMENT

Alexei Petrovich Rybalko, ulitsa Krasnooktyabrskaya, 77, kv. 62; Viktor Vladimirovich Karpekin, ulitsa Artema, 163a, kv. 24; Nikolai Sidorovich Didenko, ulitsa Artema, 163, kv. 12, and Ivan Ivanovich Volokhov, ulitsa Artema, 159, kv. 129, all of Donetsk, U.S.S.R.

Filed Apr. 24, 1974, Ser. No. 463,845
Claims priority, application U.S.S.R., May 3, 1973, 1913869
Int. Cl. F25d *17/00*
U.S. Cl. 62—178 **7 Claims**

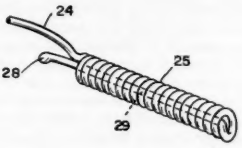
1. A gas and heat protective garment comprising: a heat insulating cover; a suit provided with pipes for circulation of a cooling medium; a knapsack accommodating a respiration protecting system and a refrigerating unit, said suit and said knapsack being enclosed with said heat insulating cover; said

refrigerating unit comprising: a reservoir with a liquid refrigerant contained therein and a heat exchanger, said reservoir and heat exchanger serving the purpose of abstracting heat from said cooling medium circulating in said pipes of said suit, a pneumatic pump actuated by refrigerant vapour, a pipeline connecting said pneumatic pump with a gas cushion in said refrigerant reservoir, a pressure regulator incorporated in said



pipeline, a vapour pipe forming a part of said pipeline, a portion of said vapour pipe being arranged to extend above the level of the liquid refrigerant contained in said reservoir, said extending portion of the vapour pipe being movably mounted in the refrigerant reservoir and adapted to remain in a vertical position when said refrigerant reservoir changes its attitude, this constructional arrangement permitting only refrigerant vapour to pass to said pneumatic pump.

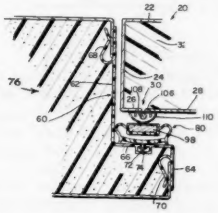
3,869,872
EXPANSION VALVE SENSOR BULB
Robert C. Webber, P.O. Box 217, Indianapolis, Ind. 46206
Filed Nov. 9, 1973, Ser. No. 414,313
Int. Cl. F25b *41/04*
U.S. Cl. 62—225 **5 Claims**



1. In combination with an expansion valve having an actuator chamber, the invention which comprises a ductile capillary tube having its proximal end in communication with said chamber, the said tube having its distal region formed to define a long spiral coil closed at its extremity, and the distal region of said tube being threaded back through the entire length of said coil to project beyond the proximal end of said coil.

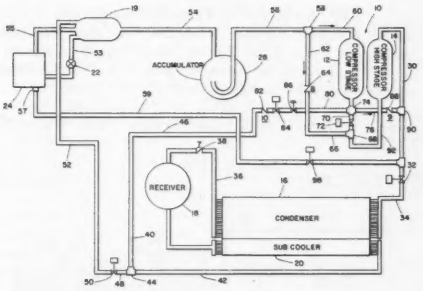
3,869,873
DOOR STRUCTURE FOR LARGE FREEZER
John M. Thomas, Indianapolis, Ind., assignor to Elliott-Williams Company, Inc., Indianapolis, Ind.
Filed May 20, 1974, Ser. No. 471,199
Int. Cl. F25d *21/06*
U.S. Cl. 62—275 **10 Claims**

2. In a refrigeration system, means providing a rectangular access opening comprising frame means bounding at least the sides of said opening and door means for closing said opening, said frame means including, for each side of said opening, an outer skin providing a longitudinally and inwardly extending first flange, an inner skin providing a longitudinally and outwardly extending second flange parallel to said first flange, said second flange being offset from said first flange toward the opposite side of said opening, a jamb trim plate disposed between and engaging said flanges, said trim plate including a longitudinally extending outer portion parallel to and engaging said first flange, a longitudinally extending inner portion parallel to and engaging said second flange, and an intermediate portion perpendicular to and connecting said outer and



inner portions, said intermediate portion providing a longitudinally extending and outwardly facing gasket mounting surface, a gasket mounted against and extending longitudinally along said surface, and said door means including heater strip means extending longitudinally along the edge portions thereof to bear against said gasket when said door means is closed.

3,869,874
REFRIGERATION APPARATUS WITH DEFROSTING SYSTEM
John L. Ditzler, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 2, 1974, Ser. No. 430,296
Int. Cl. F25b *47/00*
U.S. Cl. 62—278 **1 Claim**

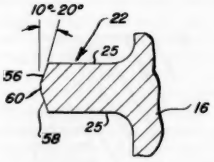


1. A refrigeration system comprising: a compressor, a condenser, an expansion device and an evaporator all connected in closed-circuit, refrigerant flow relationship, said compressor having a low stage and a high stage; means for conducting refrigerant from said low stage to said high stage in series flow during refrigeration operation; a hot gas defrost line connecting said compressor to said evaporator; a hot gas line connecting said high stage to said condenser; a suction gas line connecting said evaporator and said low stage; an interstage gas line connecting said low stage and said high stage; a valve in said interstage gas line; a branch line connecting said evaporator and said high stage, whereby upon closing of said valve, suction gas will flow through said low stage and said high stage in parallel; and means for cooling gas flowing through said interstage gas line.

3,869,875
ICE CHIP OR FLAKE PRODUCING MACHINE

Jerry M. Verlinden, and Gary D. Swinford, both of Denver, Colo., assignors to Mile High Equipment Company, Denver, Colo.

Filed Mar. 29, 1973, Ser. No. 346,100
Int. Cl. F25c *1/14*
U.S. Cl. 62—354 **8 Claims**

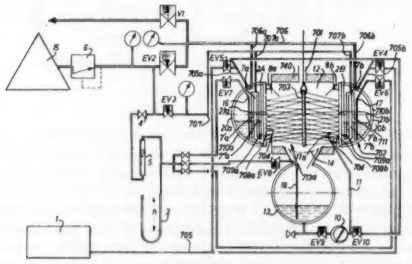


1. In an ice chip producing machine which includes an elongated cylindrical freezing chamber having one end thereof at a higher elevation than the other end, means for supplying water to the inside of said freezing chamber, means for cooling the wall of said freezing chamber to freeze ice on the inside surface thereof, and an ice conveying auger journalled for rotation generally about the central longitudinal axis of the freezing chamber, the auger including a spiral wiper blade which protrudes outwardly of the auger by means of a pair of sides disposed transverse to said axis and which is disposed in closely spaced relation to the inside wall of said chamber to shear off ice frozen thereon and carry said sheared off ice upwardly through the chamber for delivery out of the top thereof, the improvement comprising: said spiral wiper blade of the ice conveying auger being shaped, in cross section, to have a generally double bevelled configuration, with a leading edge portion extending at an angle of approximately 10°–20° to the inside wall of said freezing chamber and a relieved trailing edge portion oblique to the two sides of the wiper blade and the inside wall of said freezing chamber.

3,869,876
APPARATUS FOR TEMPERING GLASS

Maurice Gardent, Meylan; Wadislaw Michalak, Sassenage, and Roger Prost, Saint Egreve, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed June 12, 1973, Ser. No. 369,212
Claims priority, application France, June 15, 1972, 72.21543
Int. Cl. F25d *17/02*
U.S. Cl. 62—376 **12 Claims**

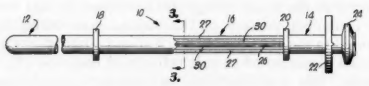


1. A device for tempering objects by the projection of a refrigerant liquid onto a said object when the latter is heated to its softening temperature, comprising means defining a heat-insulated tempering chamber that provides a passageway for said objects, a projection system for refrigerant liquid comprising a projection bench directed toward the interior of said chamber, means for supplying said liquid to said projection bench from a main storage tank, a heat-insulated recovery receptacle for the residual refrigerant liquid disposed at a lower part of said tempering chamber, means for recycling said residual liquid from said recovery receptacle to said projection bench, said means for supplying said liquid further comprising at least one auxiliary storage tank adjacent said projection bench, means for feeding said refrigerant liquid from said main storage tank to said auxiliary tank, a siphon between said auxiliary storage tank and said projection bench, and pressurizing and de-pressurizing means for said auxiliary storage tank whereby when said auxiliary storage tank is pressurized, said refrigerant liquid flows through said siphon from said auxiliary storage tank to said projection bench.

3,869,877
DRIVE SHAFT

George R. Brahler, 944 Kentucky, Lawrence, Kans. 66044

Continuation-in-part of Ser. No. 149,590, June 3, 1971, Pat. No. 3,740,853, which is a continuation-in-part of Ser. No. 17,432, March 9, 1970, abandoned. This application Apr. 18, 1973, Ser. No. 352,185
Int. Cl. F16d *1/02*
U.S. Cl. 64—2 R **7 Claims**



1. A unitary, flexible, rotatable drive shaft for transmitting power around a corner, said shaft comprising:
- a base stretch operably coupled with a power source;
- a head stretch capable of being angularly offset relative to said base stretch; and
- a central stretch interconnecting said base stretch and said head stretch and integrally molded therewith of like material to define an area of bend therebetween,
- said central stretch having a plurality of grooves disposed longitudinally therealong and spaced about the perimeter thereof to present a plurality of integral, elongated strand-like elements each extending along said central stretch in longitudinal parallelism with one another and with the longitudinal axis of said central stretch and being substantially coextensive in length therewith prior to bending of the central stretch to present said area of bend,
- said elements presenting a longitudinally twisted, cable-like configuration in the area of said bend when said central stretch is bent and rotative power is applied to said shaft.

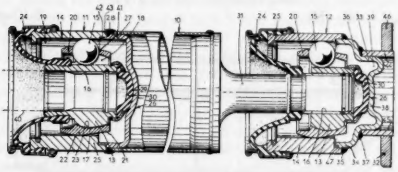
3,869,878
UNIVERSAL JOINTS

John Hazlewood Davies, Barton-under-Needwood near Burton-on-Trent; Bertram Joseph Palmer, Barton-under-Needwood nr. Burton-on-Trent; Leslie George Fisher, Birmingham, all of England, assignors to GKN Transmissions Limited, Birmingham, England

Filed Mar. 30, 1973, Ser. No. 346,268
Claims priority, application Great Britain, Mar. 30, 1972, 14972/72
Int. Cl. F16d *3/02*
U.S. Cl. 64—8 **11 Claims**

1. A universal joint comprising an outer member having a side wall defining an axial bore and an end wall closing one end of said bore, an inner member disposed in said bore, and torque-transmitting means operatively connecting together the two members internally of said bore such that the members are movable angularly relative to one another whilst permitting a continuous torque-transmission between the members, the outer member comprising a main component

constituting the side wall of said member and an initially separate component constituting the end wall of said member and secured to the main component, said initially separate component presenting an outwardly projecting spigot formation coaxial with the bore of the member and for engagement



in an end portion of a tubular drive shaft, wherein the main component has an internal rebate formed at one end thereof and the initially separate component has an axially projecting peripheral flange which fits inside the rebate and forms with the main component an external corner which receives a welding fillet securing the two components together.

3,869,879

ADJUSTING MEANS FOR ADJUSTABLE PARTS IN KNITTING MACHINES

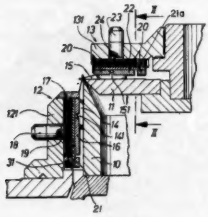
Heinz Brunner, Ebingen, Germany, assignor to Mayer & Cie Maschinenfabrik, Wuerth, Germany

Filed Aug. 1, 1972, Ser. No. 276,960

Claims priority, application Germany, Aug. 4, 1971, 2138963; Oct. 28, 1971, 2153748

Int. Cl. D04b *9/06*

U.S. Cl. 66—19 **4 Claims**



1. In a knitting machine, a first member being adjustably mounted in a predetermined direction in a second member, said first member having a guiding portion and said second member having a guide groove both of which extend in said predetermined direction, said guiding portion and guide groove having confronting mating splined surfaces which extend in said predetermined direction so that when the guiding portion is disposed in said guide groove the guiding portion is adapted to be adjustably moved therein through an arbitrary distance in said predetermined direction without appreciable displacement in a direction transverse to said predetermined direction; and cam means operatively connected to said guiding portion.

3,869,880

Patent Not Issued For This Number

3,869,881

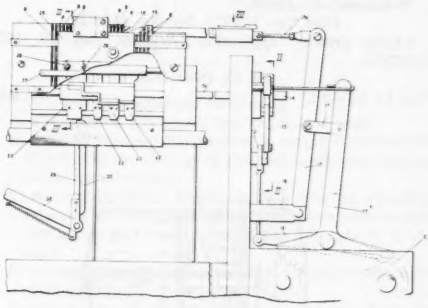
METHOD AND MACHINE FOR MAKING TOE PIECES FOR SOCKS AND STOCKINGS

Luis Sentis Anfruns, No. 2 and 4 Panama St., Barcelona, Spain

Continuation of Ser. No. 166,768, July 28, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,416

Int. Cl. D04b *7/04*

U.S. Cl. 66—64 **3 Claims**



1. A method of making from yarn or the like a knit toe piece having individual, closed ended, tubular toe sheaths connected to a toe piece body, comprising:

A. flat knitting a first course in a Lamb-type knitting machine using a first group of needles, said first course substantially corresponding in width to the desired width of a first toe sheath; and leaving a free end of yarn at the beginning of said first course;

B. tubular knitting succeeding courses continuously from said first course towards an upper, open end of said first toe sheath;

C. casting off the loops of the last-knit course of said first toe sheath at its open end and laterally shifting said first sheath with respect to said group of needles a predetermined distance without cutting the yarn forming the sheath;

D. sequentially flat knitting over desired widths the first course of the next successive toe sheaths and tubular knitting the remaining courses of said successive toe sheaths using at least some of the needles selected from said first group of needles;

E. casting off the last knit row of loops of each successive toe sheath except the last sheath upon the completion of each sheath, and laterally displacing in the same direction said successive toe sheaths except the last sheath a predetermined distance with respect to said first group of needles, leaving a length of yarn between successive toe sheaths to thereby place all sheaths in laterally spaced, aligned proximity to each other, separated by a predetermined distance, and with a length of yarn extending between successive toe sheaths;

F. continuing to knit from said last sheath in tubular fashion the body of the toe piece towards an open end thereof, connecting together the open ends of all said toe sheaths in the process;

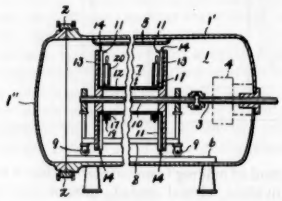
G. removing the knit toe piece from the knitting machine;
H. placing a suitable mold in each toe sheath for shaping said sheaths;
I. cutting the yarn lengths connecting the toe sheaths and drawing the closed toe ends into puckers while said molds are within said toe sheaths using the appropriate free ends of the cut yarn lengths and the said free end of yarn at the beginning of said first sheath; and
J. locking the free and cut yarn lengths in place in the knit fabric of the toe piece.

3,869,882

APPARATUS FOR TREATING FABRICS WITH STEAM

Tadashi Miyamoto, and Masaaki Iwahashi, both of Wakayama, Japan, assignors to Wakayama Iron Works Ltd., Wakayama-shi, Japan

Filed Nov. 7, 1973, Ser. No. 413,526
Claims priority, application Germany, July 26, 1973, 2337874
Int. Cl. D06c *1/00*
U.S. Cl. 68—5 C 5 Claims



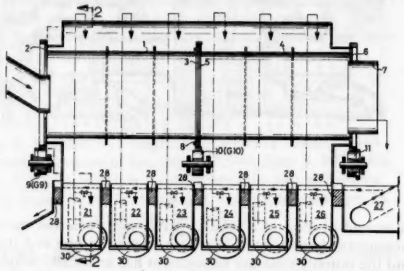
1. Apparatus for use in treating dyed fabric with steam to fix the dye thereof comprising a horizontally positioned steam autoclave, a closure plate mounted at one end of said autoclave and openable to provide access thereinto, a rotatable drive shaft positioned in one end of said autoclave and drivable by drive means positioned exteriorly of said autoclave, steam generating means positioned within said autoclave to pressurize same with steam, a support table positioned within said autoclave, said support table having means to permit its ready insertion into or withdrawl from said autoclave, a winding reel mounted on said support table, said winding reel including a support shaft mounted on said support table and operably connected in detachable relationship to one end with one end of said drive shaft, a plurality of grooved support arms extending radially outwardly from each end of said support shaft, the support arms of one end being complementary with the support arms of the other end, with the groove of each of the support arms facing inwardly from one end toward the inwardly facing groove of its complementary arm, a plurality of fabric supporting bar means horizontally mounted with their opposite ends removably fitted in the grooves of each pair of complementary support arms and spanning the distance therebetween, a pair of bar support cams rotatably mounted on and coaxially with said support shaft, said bar support cams having alternate ridges and recesses formed around the peripheral surface thereof to support opposite ends of said bar means and means for rotating said cams to a predetermined position to receive the opposite ends of said bar means in the respective ridges or recesses.

3,869,883

CONTINUOUS WASHING MACHINE

Erhard F. Rotter, Dusseldorf, Germany, assignor to Hans F. Arendt, Bleichensell, Germany

Filed June 6, 1973, Ser. No. 367,539
Claims priority, application Germany, June 7, 1972, 2227567
Int. Cl. D06f *21/04, 37/04*
U.S. Cl. 68—58 8 Claims



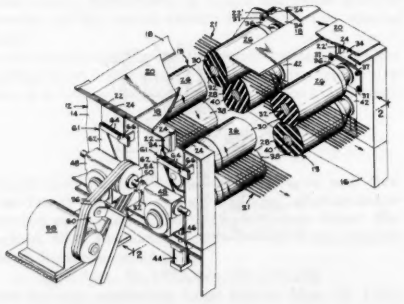
1. A washing machine comprising a row of serially arranged tanks, a tubular, articulated, rotatable, washing drum located above the tanks, the washing drum comprising at least two flexibly connected component drums, a first component drum having pins extending therefrom and through a flange of a second component drum, means for adjustably and rotatably supporting the washing drum above the tanks, and means for circulating a washing liquid from at least one of the tanks to the washing drum independent from any motion of the washing drum.

3,869,884

TORQUE ARM ASSEMBLY FOR NIP ROLLERS

Vernon E. Deadman, 36 Allerford Rd., London, S.E., F3 DE, England

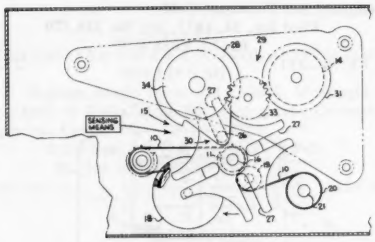
Filed Mar. 21, 1973, Ser. No. 343,326
Int. Cl. D06f *45/00*
U.S. Cl. 68—258 6 Claims



1. A nip-roller assembly for compressing articles passing through a laundry machine, comprising spaced upstanding side-frame members between which laundry articles are to be conducted along a longitudinal path of continuous movement, a plurality of longitudinally spaced pairs of nip rollers supported by and between said frame members and along said path, each pair comprising a lower driving roller and an upper driven roller, means providing fixed bearing support in said frame members for the respective ends of the driven rollers, means providing vertically floating and upwardly pressure-loaded bearing support guided with respect to said side-frame

members and independent for the respective ends of the driving rollers, a separate housed reduction-gear mechanism having output connection to each driving roller at one side frame, each gear mechnism and its housing thus floating with the end of the driving roller which it serves, the input-shaft alignments of adjacent reduction-gear mechanisms being generally horizontally aligned, universal-coupling means interconnecting the inputs to said adjacent gear mechanisms, torque-reacting link means for each gear housing and pivotally interconnecting a point on the adjacent side-frame member to a point on the applicable gear housing, said point of connection to the applicable gear housing being offset in elevation from the associated drive-roller axis, and said point of connection to the side-frame member being essentially horizontally offset from the gear housing connection point, whereby said reduction-gear mechanisms may be driven in unison with uniform output speeds while independently elevated to maintain constant loading pressure on passing laundry articles of varying thickness.

3,869,885
LOCKING SYSTEM
Frederick W. Uthenwoldt, Glenbrook, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Oct. 1, 1973, Ser. No. 402,097
Int. Cl. E05b *37/16;* **G05g** *5/00*
U.S. Cl. 70—315 **4 Claims**



1. A combination locking system of the type having a tape containing a plurality of predetermined reference combinations serially disposed thereon, said tape being advanced to a new reference combination position for each unlocking operation performed upon said system, a new combination being entered into said locking system for each unlocking operation, which newly entered combination being required to complement a new predetermined reference combination which has been advanced upon said tape in order to unlock a lock of said locking system, the combination locking system comprising:

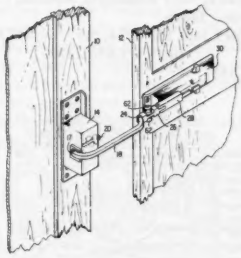
sensing means for sensing the reference combination appearing on the tape adjacent said sensing means and comparing said reference combination with said entered combination;

tape driving means associated with said sensing means for positively advancing the tape past said sensing means thereby moving successive reference combinations past said sensing means, said positive tape driving means comprising at least one sprocket wheel, an actuating mechanism operatively connected to said sprocket wheel for positively turning said sprocket wheel, said tape being in contact with said sprocket wheel and aperatured to conform to said sprocket wheel, said tape being advanced by said sprocket wheel when said actuating mechanism turns said sprocket wheel;

positioning means operatively connected to said driving means for incrementally positioning a new reference combination adjacent said sensing means with each actuation of said positioning means; and

means operatively connected to said positioning means for actuating said positioning means in response to the complementing of the reference combination with the entered combination.

3,869,886
SAFETY LOCK
Jose A. Diaz, 3901 Kennedy Blvd., Union City, N.J. 07087
Filed Oct. 29, 1973, Ser. No. 410,635
Int. Cl. E05b *65/00*
U.S. Cl. 70—93 **2 Claims**



1. A safety lock apparatus comprising:

A. a restraihing arm having first and second ends;

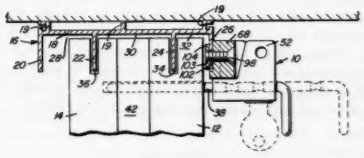
B. a sliding bolt pivotally attached in hinged manner to the first end of the restraining arm and comprising laterally extending projections;

C. means adapted for attachment to a door for releasably retaining the laterally extending projections while permitting lateral movement of the sliding bolt relative to the door;

D. a lock plunger pivotally attached in hinged manner to the second end of the restraining arm; and

E. lock means adapted for attachment to a door frame for releasably retaining the lock plunger.

3,869,887
SURFACE MOUNTED LOCK UNIT FOR SLIDING DOORS
Harry Zeit, 20255 N.W. Sixth Ave., Miami, Fla. 33169
Filed May 30, 1973, Ser. No. 365,144
Int. Cl. E05b *65/08*
U.S. Cl. 70—100 **15 Claims**



1. In combination with a track and at least one closure panel slidably mounted therein, said track including at least two parallel spaced fins for guiding sliding movement of said panel, a lock device adapted to be mounted on one of said fins, said lock device comprising:

a. a block having at least one planar face;

b. means for mounting said block on one of said fins with said planar face adjacent one side of said mounting fin;

c. a guide bore in said block substantially perpendicular to said planar face; and

d. a lock pin slidable in said bore into engagement with said panel;

e. said means for mounting said block including at least one mounting bore in said block communicating with and perpendicular to said planar face, connecting means extending through said mounting bore and said fin, and

plate means adjacent the side of said fin remote from said block in engagement with said connecting means, said plate means including two flat, spaced apart parallel faces, the distance between said faces being less than the distance between said mounting fin and said sliding panel, and said connecting means terminating within said plate means.

3,869,888

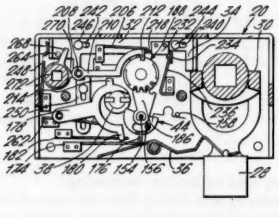
LOCK

Kenzo Yoshizawa, 48-3 Kitamachi Minami, Chudoji, Shimogyo-ku, Kyoto, Japan

Filed Jan. 11, 1974, Ser. No. 432,693

Int. Cl. E05b *21/00*

U.S. Cl. 70—355 **6 Claims**



1. A lock comprising a single key having first and second engagement elements, a rotary shaft having longitudinal grooves adapted to receive both engagement elements of said key, a first mating engagement member associated with said first engagement element arranged around said rotary shaft so that it is engaged by said first engagement element upon the first rotation of said single key together with said rotary shaft through a given angle, a second mating engagement member associated with said second engagement element arranged around said rotary shaft so that it is engaged by said second engagement element upon the rotation of said key together with said rotary shaft through a fixed angle subsequent to said first rotation of said key, engagement prevention-cancelling means operatively connected to said two mating engagement members in such a manner that before said first engagement element engages its mating engagement member, said second engagement element is rendered unable to engage its mating engagement member, and that after said first engagement element engages its mating engagement member, said second engagement element is rendered able to engage its mating engagement member, and unlocking operative means operatively connected to the mating engagement member associated with said second engagement element in such a manner that it is actuated upon engagement of said second engagement element with its mating engagement member.

3,869,889

TUMBLER MECHANISM FOR CYLINDER LOCK

Herman Prahl, 43-38th Fifty-Eighth Ln., Woodside, N.Y. 11377

Filed June 18, 1973, Ser. No. 370,657

Int. Cl. E05b *63/00*

U.S. Cl. 70—419 **11 Claims**

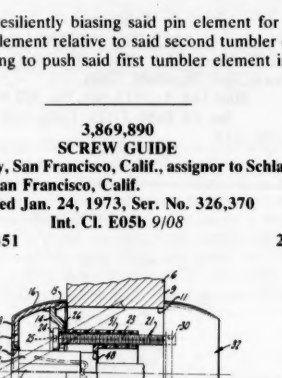
1. A tumbler mechanism for a cylinder lock comprising:

a first tumbler element extending into a key slot for movement upon the insertion of a key into said key slot;

a second tumbler element for axially aligning with said first tumbler element and moveable thereby upon the insertion of said key in said key slot;

a bore axially passing through said second tumbler element;

a pin element passing through said bore for engaging said first tumbler element and moveable thereby upon the insertion of a key in said key slot, said pin element having an enlarged head portion at its end opposite its end engaging said first tumbler element and having a stem portion extending therefrom which engages said first tumbler element, said stem portion having a smaller cross-sectional area than the cross-sectional area of said first tumbler element at their respective engaging surfaces; and



means for resiliently biasing said pin element for moving said pin element relative to said second tumbler element and tending to push said first tumbler element into said key slot.

3,869,890

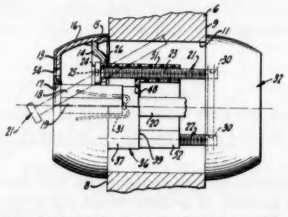
SCREW GUIDE

Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jan. 24, 1973, Ser. No. 326,370

Int. Cl. E05b *9/08*

U.S. Cl. 70—451 **2 Claims**



1. In a door lock device mounted on a panel having a recess therethrough, a cover unit overlying said recess on one side of said panel and having a lock mechanism thereon provided with a rotatable driver bar extending into said recess, and a pair of parallel holding screws engaging said cover unit and extending through said recess into engagement with a cover member overlying said recess on the other side of said panel, the improvement comprising:

a member in said recess having a transverse wall in said recess spaced inwardly from said cover unit;

resilient means releasably securing said member to said cover unit;

said transverse wall having an opening therethrough, through which said driver bar loosely extends and a pair of tubular guides projecting inwardly therefrom and through which said holding screws slidably extend; and

an arcuate flange extending inwardly from said transverse wall and at least partially surrounding said driver bar.

3,869,891

SPEED OPTIMIZING SYSTEM FOR A ROLLING MILL

John D. Higham, Menlo Park, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Apr. 8, 1974, Ser. No. 458,840

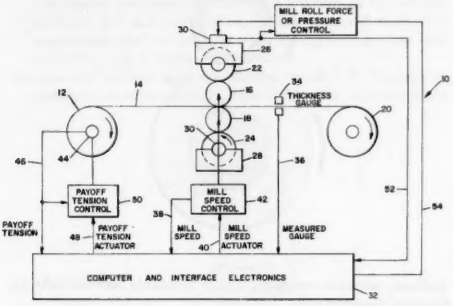
Int. Cl. B21b *37/12, 37/06*

U.S. Cl. 72—8 **16 Claims**

14. An apparatus for a rolling mill having a mill variable control means and a mill speed control means for optimizing

the speed of strip material through the mill, said apparatus comprising:

a. gauge feedback control means for generating a signal supplied to the mill variable control means so as to maintain the measured gauge at a constant target value;



b. means for generating a speed change signal as a function of an output of said variable control means; and

c. means for combining said speed change signal with a speed setpoint to produce a new speed setpoint for said mill speed control means.

3,869,892

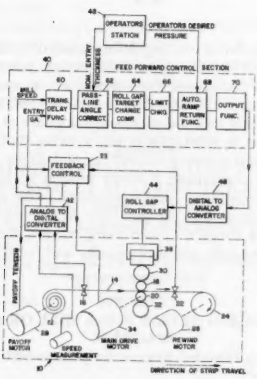
FEED FORWARD GAUGE CONTROL SYSTEM FOR A ROLLING MILL

John D. Higham, Menlo Park, and Colin J. McNaught, San Jose, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Apr. 8, 1974, Ser. No. 458,842

Int. Cl. B21b *37/02, 37/14*

U.S. Cl. 72—9 **12 Claims**



1. A method for controlling the gauge without changing the shape of strip material issuing from a rolling mill that includes a payoff reel, a pair of pressure rolls to produce a desired roll force, pressure control means for varying the pressure of said rolls on the strip material and the gap between them, a takeup reel, an input gauge between said payoff reel and said rolls, tension control means for the strip material, an output gauge and feedback means connected to said output gauge, said method comprising the steps of:

generating a signal at the input gauge for determining a variation in the gauge of material from the payoff reel from a nominal thickness;

producing a primary control function causing said pressure control means to operate in response to the variation in gauge detected by said input gauge when the actual gauge variation reaches said pressure rolls, said primary control function operating on said pressure rolls to change their force on the strip at a relatively rapid rate to substantially eliminate the thickness variation;

superimposing a secondary function on said pressure control means immediately after the activation of said primary function, said secondary function causing the changed force of the pressure rolls on the strip material by said primary control function to commence returning at a relatively slow steady rate toward the original preset level and thereby causing a relatively small variation in target gauge of the material passing from said rolls;

generating an error signal proportional to said small variation at the exit gauge; and

utilizing said error signal to activate a mill control means for eliminating said small variation in gauge.

3,869,893

COINING PRESS

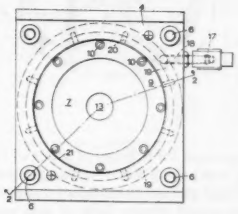
John Edward Plaister, Bromsgrove, and Leonard Edward Cole, Birmingham, both of England, assignors to Taylor & Challen Limited, Birmingham, England

Filed July 19, 1973, Ser. No. 380,867

Claims priority, application Great Britain, July 21, 1972, 34155/72; Nov. 4, 1972, 50911/72

Int. Cl. B21b *45/04*

U.S. Cl. 72—39 **6 Claims**



1. A collar plate assembly for a coining press comprising an outer support assembly and a die support member enclosed within said support assembly so as to be movable relative to the latter along an axis which is substantially vertical in use, said support assembly comprising a support plate at its upper end with an aperture through it, a collar plate which is received in said aperture in the support plate, means which spring urges the collar plate upwards, and inlet connection means for a pressurized air supply which communicates with the peripheral region of the collar plate so that in use the air from the pressurized supply escapes upwards around the whole periphery of the collar plate so as to resist the ingress of powder into the collar plate assembly.

3,869,894

METHOD OF TREATING IRON AND STEEL WORKPIECES PRIOR TO COLD WORKING

Norbert Meyer, Bruchkobel; Han Yong Oei, Frankfurt am Main; Werner Rausch, Oberursel, and Horst Schneider, Frankfurt am Main, all of Germany, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Nov. 5, 1973, Ser. No. 413,102

Claims priority, application Germany, Nov. 7, 1972, 2254378

Int. Cl. B21j *3/00;* **B05c** *3/04;* **C23f** *7/10*

U.S. Cl. 72—42 **5 Claims**

1. In a method for the treatment of shaped iron and steel workpieces prior to cold working, making use of aqueous suspensions which contain phosphoric acid, suspended substances with laminar lattice structures and surfactants, the

improvement comprising preheating said workpiece to a temperature between 50° and 150°C, effecting a motion of said workpieces relative to each other sufficient to cause intercontact while simultaneously contacting said workpieces with said suspension having active content in an amount of between 5 and 50 g/m² of workpiece surface area and comprising 5–50% of a laminar lattice compound, 0.5–14% H_3PO_4 and 0.05–1 % surfactant, and continuing said motion until a predominant part of the water is said suspension has been evaporated.

3,869,895

ARRANGEMENT FOR FORMING SOLIDS OF ROTATION BY A CROSS WEDGE ROLLING PROCESS WITH THREE ROLLS

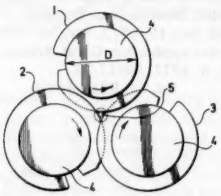
Jiri Holub, Prague, Czechoslovakia, assignor to Vyzkumny ustav tvarecich streju a technologie tvareni, Brno, Czechoslovakia

Filed Apr. 11, 1974, Ser. No. 460,168

Claims priority, application Czechoslovakia, Apr. 13, 1973, 2635-73

Int. Cl. B21h *8/02*

U.S. Cl. 72—107 **1 Claim**



1. An arrangement for forming of solids of rotation by cross wedge rolling comprising three working cylinders rotating in the same direction and symmetrically arranged with respect to the axis of the rolled object, each of said working cylinders supporting an exchangeable wedge shaped forming tool, said forming tools having forming ledges converging in the direction of their rotating movement, said forming ledges having a thickness corresponding to the dimensions of the diameters of objects to be rolled, a triangular cavity in each forming tool of sufficient depth and width between said forming ledges of each tool, to enable the rolling of objects of small diameter, a free passage in the external part of the wedge shaped tool through the triangular cavity of the adjacent wedge shaped tool so that always one wedge shaped tool may enter the cavity of its adjacent wedge shaped tool, whereby one dimension of the diameter of said working cylinders of a selected size determined by the range of diameters of objects to be rolled within this range rolls objects from the smallest to the largest diameter of this range at approximately equal lengths both for the smallest and for the largest diameters of the objects to be rolled.

3,869,896

ROLLING PROCESS

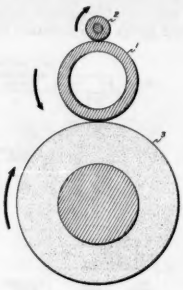
George P. Carr, Rochester, and James A. Mason, Jr., Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 266,175, June 26, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,375

Int. Cl. B21h *1/18*

U.S. Cl. 72—108 **19 Claims**

1. A rolling process for fabricating patterns in cylindrical rolls comprising providing a substantially smooth surfaced cylindrical work roll, impressing a pattern into said cylindrical work roll with an impression device while said cylindrical work roll is rotated about its axis and supported by a soft, resilient, abrasion resistant, freely rotatably substantially cylindrical backing roll.



3,869,897

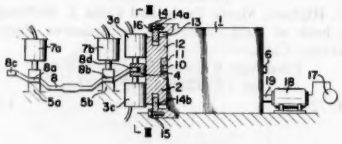
APPARATUS FOR CORRECTING DEFORMATION OF A SLENDER METALLIC PRODUCTS

Hiroshi Iida, Kariya, Japan, assignor to Manno Kogyo Kabushiki Kaisha, Anjo-shi, Aichi-ken, Japan

Filed Dec. 18, 1973, Ser. No. 425,850

Int. Cl. B21d *3/00*

U.S. Cl. 72—125 **8 Claims**



1. Apparatus for correcting deformation of a slender metallic rod in which linear, angular, and torsional distortion exist, said apparatus comprising fixed supports to support said slender rod at at least two standard points thereof, fixing means for forcibly fixing said rod at a position where at least one of said distortions is substantially nil, a swing motion creating means to impart a swing motion to said fixing means, said swing motion comprising a swing motion in one direction growing gradually larger, and thereafter a swing motion in the opposite direction growing gradually larger, and a swinging board which is coupled to said swing motion creating means and swings upwardly and downwardly and from left to right.

3,869,898

ROLL CHANGING DEVICE FOR A MILL OR A SIMILAR MACHINE

Andre Quehen, Pontoise, France, assignor to SECIM, Courbevoie, France

Filed Jan. 11, 1974, Ser. No. 432,781

Claims priority, application France, Feb. 22, 1973, 73.06229

Int. Cl. B21b *31/08*

U.S. Cl. 72—239 **1 Claim**

1. A roll changing device for a rolling mill,

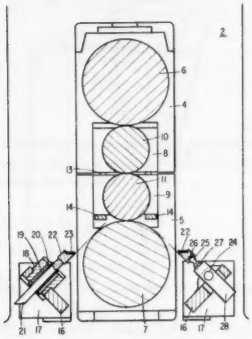
a housing having a window for receiving at least two rolls mounted in chocks, said rolls and chocks constituting an assembly unit to be removed from said housing,

said assembly unit including means for transferring said two rolls and their chocks out of said stand and also including means for maintaining fixed distances between the axes of rotation of said rolls and said transferring means,

means arranged externally of said window for guiding said assembly unit into and out of said window,

rail means movable parallel to the axes of rotation of said rolls, so constructed and arranged that their planes of displacements are set at an angle with respect to a plane passing through the axes of rotation of rolls such that the rail means are passable above the lowermost roll of said mill and in which said rail means have support means for supporting and guiding said transferring means while said assembly unit is within said window,

means for guiding said rail means parallel to themselves between an inoperative position where the rail means are



retracted and an operative position where the rail means assume a predetermined supporting and guiding relationship with said transferring means, the construction being such that the rail means are brought into contact with said transferring means of said assembly unit at an intermediate position between their inoperative and operative positions, and

means for displacing said rail means between said inoperative and operative positions,

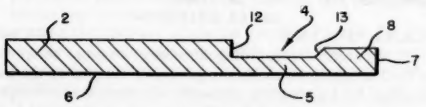
said displacing means capable of carrying said roll assembly unit when said rail means are brought into a supporting relationship with said transferring means.

3,869,899

METHOD OF FORMING A STRIP HAVING SUBSTANTIALLY DIFFERING THICKNESSES

Robert S. Bray, and Claude D. Tapley, both of Cheshire, Conn., assignors to Anaconda American Brass Co., Waterbury, Conn.

Filed Sept. 24, 1973, Ser. No. 400,228
Int. Cl. B21b *1/08*
U.S. Cl. 72—366 **3 Claims**



1. A method of continuous roll forming an elongated strip having a generally-rectangular cross-sectional area to form a strip with a cross-sectional area including a formed thicker portion and a wide formed thinner portion comprising

a. rolling the generally-rectangular strip to initially form an intermediate configuration having a thicker portion which is less thick than the generally-rectangular strip and a thinner portion which thinner portion has no thickness as great as the thicker portion and having a longitudinal depression positioned in the thinner portion and spaced from the outer edge of the strip to thereby form an edge material portion having a thickness greater than the remainder of the thinner portion;

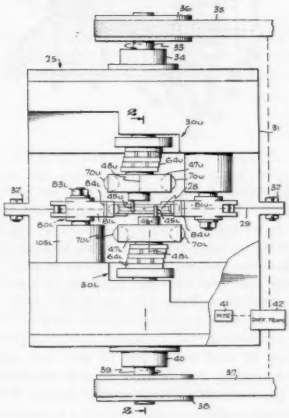
b. further rolling both thicker and thinner portions of the strip to reduce the thickness of the thicker portion and to reduce the thickness of the intermediate thinner portion while at the same time reducing the edge material portion to a thickness desired for the formed thinner portion thereby forming a strip having a formed thicker portion and formed thinner portion.

3,869,900

APPARATUS FOR BENDING WIRE INTO A SINUOUS SHAPE

Harry H. Norman, Los Angeles, Calif., assignor to Stephen Baliski, Gardena, Calif.; a part interest

Filed Mar. 6, 1974, Ser. No. 448,475
Int. Cl. B21d *41/02*
U.S. Cl. 72—384 **14 Claims**



1. Apparatus for bending wire into a zig-zag shape, comprising:

first and second identical oscillator/overbend assemblies situated facing each other on opposite sides of the plane of said zig-zag, each oscillator/overbend assembly comprising;

an oscillator assembly including a bending pin extending normally through the plane of said zig-zag, and a holder supporting said bending pin, said holder being mounted for rotation about an oscillator axis parallel to but offset from said pin,

an overbend assembly including an overbend arm and a backup tool mounted to move between a withdrawn position spaced from the wire being bent and an engaged position in which said arm and backup tool cooperate to overbend said wire about the bending pin,

oscillator cam drive means operative during each bending cycle for rotating said pin and holder about said oscillator axis first in one direction and then in the opposite direction, and thereafter for causing said pin to dwell for the completion of the bending cycle in a dwell position in which a line between said pin the oscillator axis is approximately perpendicular to the longitudinal axis of the zig-zag,

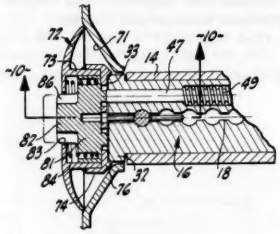
overbend cam drive means operative during each bending cycle for driving the overbend assembly into the engaged position when said pin is in said dwell position to overbend said wire about the dwelling pin, and thereafter to withdraw said overbend assembly, and

wherein said oscillator/overbend assemblies are synchronized so that while the bending pin of one assembly is in the dwell position the bending pin of the other assembly is being rotated, whereby alternate convolutes of said zig-zag are formed alternately by said first and second oscillator/overbend assemblies.

3,869,901
LOCK INDICATOR SHIELD

Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Division of Ser. No. 351,512, April 11, 1973, Pat. No. 3,224,319. This application Mar. 22, 1974, Ser. No. 453,994
Int. Cl. E05b *41/00*
U.S. Cl. 70—432 **9 Claims**

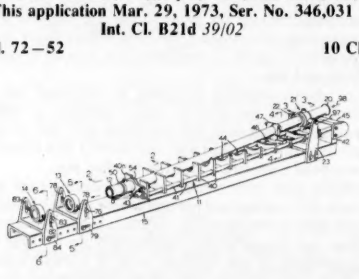


1. A lock indicator comprising a lock body, a lock plug rotatable in said body about an axis and having an inner end face and an outer end face, means defining a bore in said plug extending between said end faces, a rod slidable in said bore between a first position with the outer end of said rod close to said outer end face and a second position with said outer end of said rod projecting from said outer end face, means for moving said rod between said positions, an indicator button, means for supporting said indicator button adjacent to but independently of said outer end of said rod and for axial sliding movement on and relative to said supporting means, and means for resiliently urging said indicator button axially toward a predetermined position relative to said rod.

3,869,902
SMOOTH TAPE FORMATION OF TUBES

Rama Iyengar, Dorval; Bretislav Paul Zuber, Montreal, and Jean Raymond Boucher, Chateauguay Center, Quebec, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Division of Ser. No. 52,434, July 6, 1970, Pat. No. 3,738,141. This application Mar. 29, 1973, Ser. No. 346,031
Int. Cl. B21d *39/02*
U.S. Cl. 72—52 **10 Claims**



1. A method of forming a tube from a continuous tape of form retaining material, comprising the steps of:

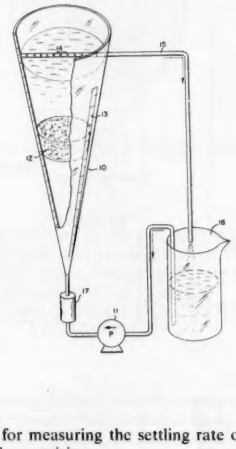
1. continuously feeding the tape longitudinally in a straight, planar path and simultaneously applying deflecting pressure laterally to the longitudinal edge portions of the tape to deflect the tape from a flat configuration to a transversely circular configuration to form a tube; and

2. stressing the tube longitudinally in substantially inverse proportion to the longitudinal stress imparted to the tape in forming the tube.

3,869,903
SETTLING RATE TESTER

William A. Beach, Milltown, and Richard M. Schlauch, Yardville, both of N.J., assignors to The Permutit Company, Inc., Paramus, N.J.

Filed July 19, 1972, Ser. No. 273,139
Int. Cl. G01n *15/04*
U.S. Cl. 73—61.4 **7 Claims**



1. Apparatus for measuring the settling rate of particulate matter in a fluid comprising:

a. an inverted cone;

b. means for passing a stream of the fluid up through the cone at a known flow rate, at least one inlet pipe tangentially connected to the cone, and means for passing a mixture of fluid and particulate matter through the inlet pipe into the cone, whereby the particulate matter accumulates at the level within the cone where the upward velocity of the fluid is equal to the settling rate of the particulate matter; and

c. means for indicating the settling rate of particles that accumulate at different levels in the cone.

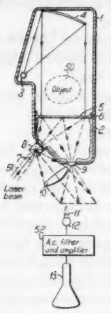
3,869,904
ULTRASONIC CAMERAS

Dennis Gabor, London, England, assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed May 10, 1966, Ser. No. 548,939
Claims priority, application Great Britain, May 12, 1965, 20025/65; July 7, 1965, 28771/65
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.5 H **18 Claims**

1. Apparatus for recording ultrasonic vibrations comprising a fluid medium, an ultrasonic generator coupled to the fluid medium for transmitting ultrasonic vibrations therethrough, a screen having a specularly reflective surface immersed in the medium and matched to the wave impedance thereof for responding to the transmitted vibrations, means for directing coherent light onto the reflective surface of the screen, means for superimposing on the resulting frequency modulated light beam reflected from the surface of the screen an angularly displaced coherent reference light beam having at least a fraction of the waves therein in phase quadrature with the waves of the reflected beam to convert the frequency modulated reflected light into a recordable amplitude modulated light beam and recording means, the recording means com-

prising a photoelectric device responsive to the resultant amplitude modulated light beam and tuned scanning means



responsive to the signal produced by the photoelectric device for producing an output signal representative of the pattern of the vibrations across the screen.

3,869,905

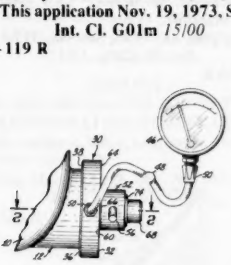
APPARATUS AND METHOD FOR TESTING ENGINE OIL PRESSURE

Marshall T. Allen, 4414 W. Hatcher Rd., Glendale, Ariz. 85302

Continuation-in-part of Ser. No. 299,874, Oct. 24, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,477

Int. Cl. G01m *15/00*

U.S. Cl. 73—119 R **6 Claims**



1. A method for testing oil pressure in an engine to determine if low pressure is being caused by a faulty oil pump assembly or by a faulty engine lubricating system, said method comprising the steps of:

a. removing the spin-on oil filter from the oil filter mounting pad of the engine to expose the oil inlet passage, the oil outlet passage and the oil chamber thereof;

b. sealing the oil chamber of said mounting pad to contain the oil supplied thereto from the oil pump assembly;

c. blocking the oil outlet passage of said mounting pad to prevent oil from being supplied therefrom to the engine lubricating system; and

d. sensing the pressure of the oil contained within the oil chamber of said mounting pad with the engine running to determine if the oil pump assembly is operating at its rated capacity.

3,869,906

ELEMENT APPLICABLE AS OR IN A TRANSDUCER (LOAD CELL)

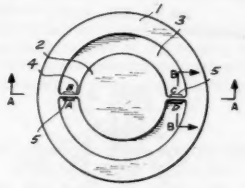
John Erik Andersson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 26, 1972, Ser. No. 318,413

Int. Cl. G01l *5/12*

U.S. Cl. 73—141 A **10 Claims**

1. A transducer element comprising a tubular outer member, an inner member coaxially disposed within said outer member, a membrane integral with one end of each of said inner and outer members for maintaining said members in annularly spaced relationship, at least two shear strained



beams integrally extending between said members, each of said beams being a thin plate integral with and perpendicular to said membrane, and strain gauges mounted on said beams.

3,869,907

TRACK SURVEYING APPARATUS

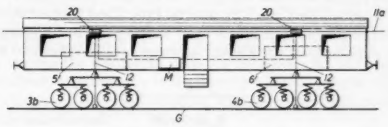
Franz Plasser, deceased, late of Johannesgasse 3, Vienna, Austria (A-1010, by said Erna Plasser, heir); Josef Theurer, Johannesgasse 3, Vienna, Austria (A-1010), and Egon Schubert, Lainzerstra 24b/8, Vienna, Austria

Continuation-in-part of Ser. No. 210,627, Dec. 21, 1971, which is a division of Ser. No. 813,854, April 7, 1969, Pat. No. 3,643,503. This application Feb. 19, 1974, Ser. No. 443,690

Claims priority, application Austria, Apr. 9, 1968, 3507/68

Int. Cl. B61k *9/08*; **E01b** *29/00*

U.S. Cl. 73—146 **9 Claims**



1. An apparatus mounted on a vehicle arranged for mobility on a track in the direction of track elongation for determining the physical condition of successive sections of the track over which the vehicle moves, comprising

1. two track engaging devices spaced from each other in the direction of track elongation;

2. means for applying a mechanical force of different magnitude to each of the track engaging devices to change the position of the track engaged by the devices, the position change being a function of the applied force;

3. a reference associated with the track for determining the position changes in relation thereto; and

4. a measuring system associated with the track engaging devices for continuously and simultaneously measuring any position changes resulting from the applied mechanical forces, the measuring system producing measuring signals corresponding to each of the measured position changes and including

a. a differentiating unit for producing a signal corresponding to the difference between any two simultaneously produced measuring signals.

3,869,908

DEVICE FOR INDICATING THE STATIC DEFORMATION OF VEHICLE TIRES

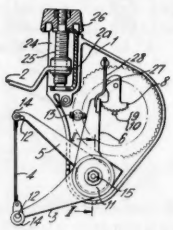
Heinrich Driendl, 6175 Kematen/Tirol, Rauthweg, Austria

Filed Dec. 10, 1973, Ser. No. 423,490

Claims priority, application Austria, Dec. 13, 1972, 10624/72

Int. Cl. B60c 23/00

U.S. Cl. 73—146.2 8 Claims



1. Device for indicating the static deformation of vehicle tires as a function of the internal pressure and load of the tire comprising a housing carrying a fixed support arm and a pivotable sensor arm, a flexible, non-stretching measuring strip connected at one end to the sensor arm and adapted to be placed against the tire side wall in the flexing area for measuring the tire deformation to indicate a variation of the deformation to be readable by means of a needle on a scale, wherein the needle is adapted to be actuated by the movable sensor arm and a control arm coupled to the sensor arm by means of a slipper clutch and movable into its zero position before measuring the improvement consisting in that the other end of the measuring band (4) is arranged on a positioning arm (5) in a manner known per se, said measuring strip extending over the flexing area only in the region of the greatest deformation, said positioning arm (5) being pivotably mounted, preferably on the shaft (15) of said sensor arm (3) in the region between the shaft (15) of said sensor arm (3) and the fixed support arm (2), and that the fixed support arm (2) is mounted for adjustment and locking on the housing (1) independently of the measuring strip in its longitudinal direction.

3,869,909

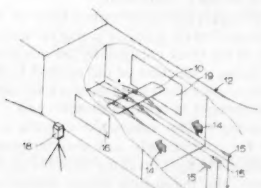
GAS FLOW VISUALIZATION SYSTEM AND CONTROL APPARATUS

Richard W. Hale; Patrick Tan; Richard C. Stowell, all of Ithaca, and Donald E. Ordway, Freeville, all of N.Y., assignors to Sage Action Inc., Ithaca, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,201

Int. Cl. G01m 9/00

U.S. Cl. 73—147 8 Claims



1. A system for supplying and monitoring the gas flow visualization performance of gas bubbles entrained in intricate and/or unsteady airstreams relative to a test specimen such as in wind tunnel studies or the like, said system comprising in combination;

an array of gas bubble generating heads disposed upstream of the test specimen;

supply means for supply of bubble forming solution and supply of compressed air and supply of bubble forming gas for each of said heads;

a supplies control and bubble performance monitoring console, said console including:

a controls support panel;

a manually operable on-off valve for each of said supply means, said on-off valves being mounted on said panel for control of supplies from said supply means;

a plurality of outlet devices carried by said panel and separate conduits detachably connected to said outlet devices and to said bubble generating heads;

separate manifold conduit devices each coupled at its inlet to the outlet of a corresponding one of said on-off valves and leading to a corresponding one of said outlet devices carried by said panel;

and an outlet flow rate metering valve for each of said outlet devices, each said metering valve being mounted on said panel for manual regulation incidental to monitoring of the performance of the system.

3,869,910

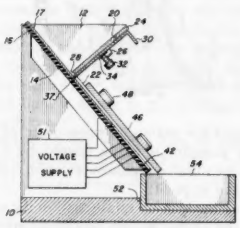
DIAGNOSTIC TEST DEVICE FOR DEVELOPER MATERIALS

Joseph Louis Scaletta, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 18, 1973, Ser. No. 371,331

Int. Cl. G01n 33/32

U.S. Cl. 73—150 R 15 Claims

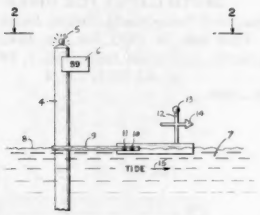


1. An apparatus for testing developer quality comprising: a support structure; a generally flat testboard carried by said support structure at an angle to horizontal; said testboard comprising a conductive surface and at least two conductive pads each electrically insulated from the other and from said conductive surface, an electrode plate carried by said support means spaced from said testboard and located opposite at least a portion of said conductive surface and said conductive pads; means for simultaneously applying different electrical field potentials between said electrode plate and each of said conductive pads and said conductive surface whereby developer may flow through the space between said electrode plate and said testboard to develop said conductive surface and said conductive pads in accordance with said field potentials.

3,869,911
WATER CURRENT OR TIDE DIRECTION-OF-FLOW INDICATOR

Howard M. Levy, P.O. Box 1150, Coconut Grove, Miami, Fla. 33133

Filed Feb. 1, 1974, Ser. No. 438,652
Int. Cl. G01w *1/00*
U.S. Cl. 73—170 A **8 Claims**

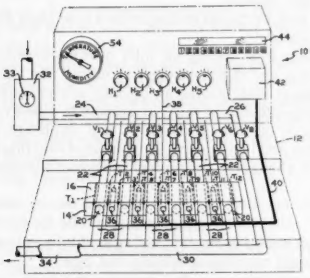


1. A water current-flow direction indicator device comprising in combination: an anchoring means for anchoring a float against being swept away by a moving water current; a float means including a buoyant structure including an attaching element secured to the anchoring means, the attaching element being located on the buoyant structure in a position such that the buoyant structure always assumes a predetermined given-position relative to the direction of flow of the water current; a visually discernable indicator means for indicating the direction in which the buoyant structure is positioned as a result of the effect of water current on the buoyant structure.

3,869,912
METHOD AND APPARATUS FOR DETERMINING TRANSFORMATION TEMPERATURES

James Horvath, Amherst, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,525
Int. Cl. G01h *25/02*
U.S. Cl. 73—150 R **11 Claims**

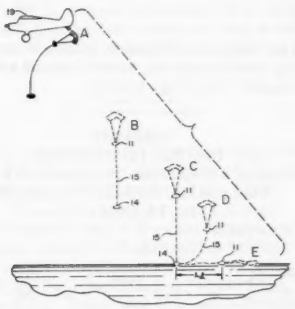


1. An apparatus for determining the temperature at which a physical transformation occurs in a material comprising:
an elongated thermally conductive test block including an essentially planar test surface thereon adapted to transfer heat to a coating of said material in thermal contact therewith,
a plurality of essentially equally spaced passages through the test block disposed along the length thereof for passage of a coolant fluid therethrough to thereby remove heat from the test surface,
means for circulating a coolant fluid through each of said plurality of passages,
means to continuously remove heat from the coolant fluid,
means for independently controlling the amount of heat removed by the coolant fluid circulating in each passage,
a plurality of heating means in the test block positioned along the length thereof between the said plurality of coolant fluid passages, thereby to provide alternately disposed heating and cooling means along the length of the test block,
means to independently control the amount of heat applied to the test block by each of said heating means,
a plurality of means to measure the temperature of the test surface at numerous points along the length thereof.

3,869,913
METHOD AND APPARATUS FOR DETERMINING SURFACE WIND VELOCITY

Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133

Continuation-in-part of Ser. No. 258,543, June 1, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 397,822
Int. Cl. G01p *13/00*
U.S. Cl. 73—189 **5 Claims**



1. The method of determining the horizontal wind velocity above an area comprising the steps of dropping two markers of predetermined and different fall rates substantially simultaneously from above said area, said markers commencing to fall at different rates at a predetermined height above said area, noting the horizontal distance between said markers at touchdown, said distance being directly related to the horizontal velocity of the wind whereby the velocity of the wind is readily ascertained.

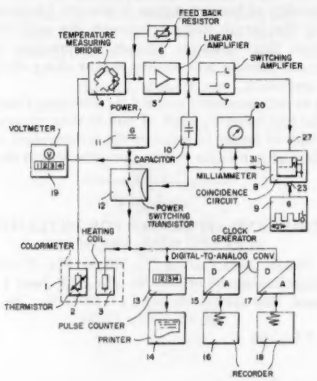
3,869,914
ISOTHERMAL CALORIMETRY METHOD AND APPARATUS THEREFOR

Waldemar Koehler; Oswald Riedel; Hertbert Scherer, all of Ludwigshafen, and Georg Schlereth, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Nov. 24, 1972, Ser. No. 308,997
Claims priority, application Germany, Nov. 25, 1971, 2158377
Int. Cl. G01k *17/00;* **G01h** *25/48*
U.S. Cl. 73—190 R **4 Claims**

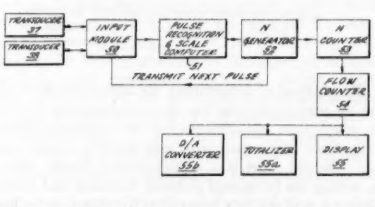
1. An isothermal calorimetry method for examining physical and/or chemical reactions of both endothermal and exothermal types, in which the temperature of the reactants is maintained at a constant value by the application of energy to an isothermal calorimetry zone, which comprises: applying said energy in the form of pulses of constant energy content; generating temperature control signals in accordance with the temperature of said reactants in said calorimetry zone; controlling the number of said pulses of constant energy transmitted per unit time, by means of said control signals while insuring that said constant energy pulses are separated in time so

that the intervals between any two transmitted pulses are integral multiples of the duration of one pulse regardless of the



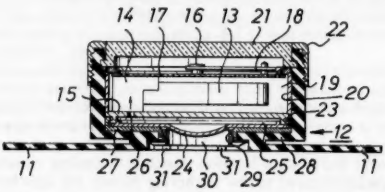
phase of any said control signal in relation to said pulses; and summating continuously the numbers of said pulses per unit time to measure the energy balance.

3,869,915
DIGITAL FLOWMETER
Joseph Baumoel, 107 Columbia Dr., Jericho, N.Y. 11753
Filed Jan. 23, 1973, Ser. No. 326,089
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 A **13 Claims**



12. Ultrasonic detection apparatus for detecting a condition of a fluid in an enclosed elongated hollow conduit; said apparatus comprising first and second transducer means secured to the exterior surface of said conduit and being axially spaced from one another along the axis of said conduit; each of said first and second transducer means being adapted to transmit to the other, and receive from the other, ultrasonic energy pulses which pass through the fluid within said conduit; and circuit means connected to said first and second transducer means for measuring the difference in time taken for ultrasonic energy pulses to reach said first transducer means from said second transducer means and to reach said second transducer means from said first transducer means, and for producing an output related to said difference in time; and clock generator means for producing a train of output pulses having a given clock frequency and counter means connected to said clock generator means; said circuit means being connected to said counter means and controlling said counter means to count up pulses from said clock generator means during the time taken for said ultrasonic energy pulses to travel from said first transducer means to said second transducer means, said last-mentioned time defining an up cycle, and to count down pulses from said clock generator means during the time taken for said ultrasonic energy pulses to travel from said second transducer means to said first transducer means, said last-mentioned time defining a down cycle; and control circuit means for controlling the sequence of said up and down cycles, whereby a given number of up cycles are initiated, followed by a corresponding number of down cycles; said given number of up and down cycles defining a read cycle for producing said output which will be related to the residual count in said counter at the end of said read cycle.

3,869,916
DEPTH GAUGE FOR DIVER
Yukio Ojima, 34-7 Naka-Machi, Tokyo, Japan
Filed July 30, 1973, Ser. No. 384,004
Claims priority, application Japan, Feb. 7, 1973, 48-15698
Int. Cl. G01f *23/14*
U.S. Cl. 73—300 **1 Claim**



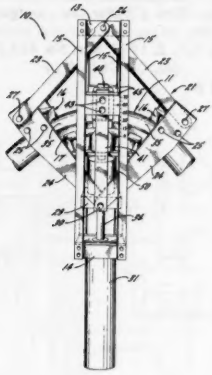
1. A depth gauge for use by a diver comprising:
a hollow rubber case open at one end and having a rubber strap integrally molded to opposite sides of the rubber case adjacent the base of said case;
said strap being resilient and stretchable and adapted to snugly fit upon a diver's wrist;
said base having a cavity with an opening communicating with the interior of the case;
a flexible diaphragm overlying and sealing the cavity opening;
a support plate positioned above said diaphragm and cooperating with said case and said diagraphm to define a first oil filled chamber;
a block member positioned upon said base plate and having a passageway;
a Bourdon tube having an inlet opening communicating with one end of the passageway in said block member;
said support plate having an opening communicating with the opposite end of said passageway to admit oil into or withdraw oil from said tube as said diaphragm alters its contour and hence alters the volume of said first chamber due to changes in the ambient pressure surrounding the case;
pivotally mounted pointer means and means coupled between said pointer means and said tube for pivoting said pointer means as the free end of said tube moves responsive to oil entering or leaving said tube;
a transparent pressure glass covering the open end of said case and means for securing and water-tightly sealing said glass to said case;
said pointer means being positioned beneath said glass and including a graduated dial face cooperating with a pointer;
the exterior of said base engaging the wrist of the diver and having substantially radially aligned grooves extending between said cavity and the perimeter of said case to provide conduits to facilitate communication of the fluid medium external to said case with said diaphragm;
said diaphragm being displaced inwardly from the exterior surface of said base to prevent the diaphragm from engaging the diver's wrist.

3,869,917

CONDUIT BENDER

Ellsworth W. Lapp, Rockford, Ill., assignor to Kinroth & Son Mfg. Co., Rockford, Ill.

Filed Sept. 4, 1973, Ser. No. 393,955
Int. Cl. B21d 7/04
U.S. Cl. 72—304 10 Claims



2. In a device for bending conduit, the combination of, a support, a forming die on said support and having a generally arcuate groove opening out of one side thereof, a pair of drawing shoes on said support and facing said groove, means mounting said drawing shoes on said support for arcuate movement about the center of curvature of said groove and in opposite directions from starting positions in which said shoes are spaced apart angularly by a predetermined distance and terminal positions in which the shoes are spaced apart angularly by a greater distance, a holding die on said support and having a generally arcuate groove opening out of one side thereof and facing the groove in said forming die, the groove in said holding die being substantially shorter in arcuate length than the groove in said forming die and being located between said drawing shoes, means for producing relative movement between said dies to close the dies upon a piece of conduit inserted therebetween, the grooves in said dies being sized to deform and tightly clamp the intervening portion of the conduit as an incident to closing of said dies, and mechanism for moving said drawing shoes from said starting positions to said terminal positions while said intervening portion is clamped between said dies whereby said drawing shoes sweep across the end portions of the conduit and draw such end portions around into the groove in said forming die.

3,869,918

TEMPERATURE MEASUREMENT DEVICE

Billie G. Oltman, Worth; Keith F. Eckerman, Joliet; Gerald P. Romberg, Lisle, and William Prepejchal, Downers Grove, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

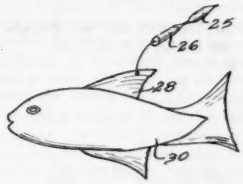
Filed Aug. 1, 1973, Ser. No. 384,680
Int. Cl. G01k 11/20
U.S. Cl. 73—339 R 4 Claims

1. A method of measuring average ambient temperatures of an area including the steps of:

a. irradiating a thermoluminescent dosimeter with a known amount of radiation,

b. exposing the irradiated thermoluminescent dosimeter to the ambient temperature of the desired area for a given length of time,

c. heating said exposed dosimeter to release energy stored therein as luminescence and measuring said luminescence, and



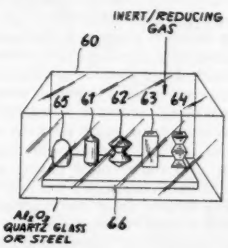
d. determining the average temperature of the environment during said given length of time according to said known amount of radiation applied to the dosimeter and said measured luminescence.

3,869,919

METHOD OF DETERMINING THE TEMPERATURE OF A HIGH-TEMPERATURE INSTALLATION AND A TEMPERATURE-INDICATING BODY

Karl-Heinz Presser, Julich, and Claus-Benedict von der Decken, Kohlscheid, both of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 23, 1971, Ser. No. 211,601
Claims priority, application Germany, Dec. 24, 1970, 2063754
Int. Cl. G01k 11/08
U.S. Cl. 73—358 4 Claims

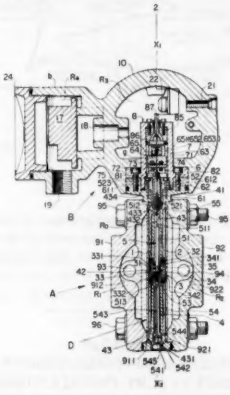


1. In a system for measuring the temperature of a high-temperature chamber, the improvement which comprises a capsule composed of a refractory material, and a plurality of elongated metallic bodies of a volume of about $1mm^3$ in said capsule, each of said bodies having a characteristic shape-changing temperature different from that of others of said bodies and in which the shape alters under the action of surface tension, each of said bodies having a surface area to volume ratio between 5 and $50mm^{-1}$ and greater than that of a sphere of corresponding mass, each said body having an axis and being mirror-symmetrical with respect to a median plane through said axis and with respect to a median plane perpendicular to said axis, said bodies being received in said capsule in a nonoxidizing atmosphere.

3,869,920
SYMMETRICALLY ARRANGED, DEFLECTION TYPE DIFFERENTIAL PRESSURE TRANSMITTERS FOR CONTROLLING INDUSTRIAL SYSTEMS AND PROCESSES

Rin-Ichi Miyauchi; Bunjiro Saito, and Kyoichi Ikeda, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Apr. 13, 1973, Ser. No. 350,930
Int. Cl. G01l *9/10, 7/08*
U.S. Cl. 73—398 R **15 Claims**



1. A differential pressure transmitter for controlling fluid flow rate and other parameters which can be related to a pressure differential in industrial systems and processes, comprising:

housing means;

pressure responsive means including two diaphragm members mounted in generally parallel, spaced relation in said housing means and being symmetrical when in their rest position about an axis of symmetry extending perpendicularly to the diaphragm axis; connecting means for linking said diaphragm members together at their centers; and a spring rod mechanism comprising a rod element for transmitting movement of said connecting means out through the pressure responsive means to permit sensing thereof, said rod element being secured at a first portion to said connecting means; support means pivotally mounting at least one end of said rod element with respect to said housing means; said rod element having at least one second portion thereof constructed and arranged to provide for bending thereof about the longitudinal axis of said rod element as said connecting means moves with said diaphragm members; an extension member secured to said one end of said rod element to effect angular movement in response to bending movement of said second rod element portion so as to transmit such movement beyond said pressure responsive means;

a high pressure receiving chamber located in said housing means to communicate with one of said diaphragm members;

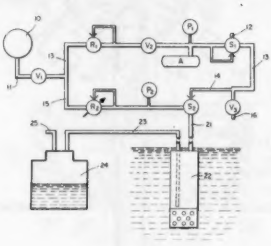
a low pressure receiving chamber located in said housing means to communicate with the opposite diaphragm member;

means for detecting displacement and converting displacement into an output response mounted above said pressure responsive means and including means responsive to the angular movement of the outer end of said extension member whereby a pressure differential created between said high and low pressure receiving chamber produces a resulting force which causes both diaphragm members to deform, transversely displacing said connecting means and axially bending said second rod element portion to angularly displace said rod extension member, the movement of the rod extention member being detected and converted to an output response by said detecting and converting means.

3,869,921
LIQUID SAMPLING

Malcolm F. Irwin, West Chester, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

Filed Nov. 2, 1973, Ser. No. 412,275
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 B **7 Claims**



1. In liquid sampling apparatus operable from a source of propellant fluid under pressure, to collect samples of liquid from a body thereof, the improvement comprising a first conduit having means therein operable at relatively low pressure for controlling the interval of time between successive samples and the duration of time for collecting each sample and a second conduit having means therein normally closing off the body of liquid from the pressurized fluid and adapted to open to admit such fluid under relatively high pressure to propel a sample therefrom, the respective conduits being connected in parallel to the source of pressurized fluid; the first or timing means comprising in the first conduit a sampling interval flow-regulating valve and, in sequence downstream therefrom, an accumulator tank, a first pressure-responsive switching valve, and a sample duration flow-regulating valve, to the atmosphere; the first switching valve being interconnected to sense the pressure of fluid accumulated immediately upstream therefrom, being normally closed below a given accumulated pressure, and adapted to open at a given higher accumulated pressure; the second or sample propulsion means comprising a second pressure-responsive switching valve in the second conduit, being normally closed to the body of liquid to be sampled and interconnected to sense the accumulated low pressure while the first pressure-responsive switching valve is open, and being adapted to open at a given pressure therein and to reclose at a given lower pressure therein.

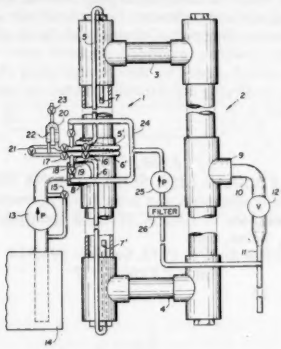
3,869,922
APPARATUS FOR MEASURING PAPER STOCK CONSISTENCY

Jack Fajans, Teaneck, and John E. Nankivell, Florham Park, both of N.J., assignors to Gravicon Corporation, Teaneck, N.J.

Filed Oct. 29, 1973, Ser. No. 410,755
Int. Cl. G01n *9/26*
U.S. Cl. 73—438 **4 Claims**

1. In an apparatus for measuring the specific gravity of a suspension of a solid in a continuous liquid phase as a measure of the concentration of said solid in said suspension, the apparatus including a container having an inlet and two outlets communicating with the ambient atmosphere; two restricted nozzles vertically spaced in said container from said inlet in opposite vertical directions in the normal operating condition of the apparatus, said outlets being spaced from respective

ones of said nozzles in a direction away from said inlet; a source of said suspension; first pump means for driving said suspension from said source into said container through said inlet and out of said container through said outlets; pressure holding means for holding the pressure of said suspension between said nozzles at least ten pounds per square inch higher than the pressure of said atmosphere when said suspension is driven into said container by said pump means; two conduits respectively communicating with said nozzles and having respective portions spaced from said nozzles; and differential pressure indicating means for indicating the differ-



ence of liquid pressure in said portions of said conduits, the improvement which comprises:

a. second pump means communicating with said source and with each of said conduits for withdrawing a stream of said suspension from said source and for feeding respective parts of said stream to said conduits under a pressure sufficient to cause flow of said parts in said conduits and outward of said nozzles into said container; and

b. filter means arranged in series with said second pump means between said source and said conduits for removing said solid from said stream before said parts are fed to said conduits.

3,869,923

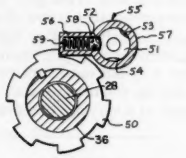
DEBRIS COLLECTING APPARATUS

Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Division of Ser. No. 268,064, June 30, 1972, Pat. No. 3,849,043. This application Aug. 27, 1973, Ser. No. 391,600

Int. Cl. F16d *41/16*

U.S. Cl. 74—13 **10 Claims**



1. In a wheeled vehicle wherein a revolving element or the like is rotated about an axle by the wheels, drive means for rotating the revolving element in either direction and for rotating the wheels of the vehicle without rotating the revolving element comprising at least one ratchet wheel connected to the revolving element, the revolving element being rotated when said ratchet wheel is rotated, a pawl spindle mounted on at least one of the wheels of the vehicle for planetary movement about said ratchet wheel, said spindle having three cam surfaces disposed about the periphery of said spindle, a pawl element pivotally surrounding said cam surfaces of said spindle, means carried by said pawl element and frictionally bearing against one of said cam surfaces of said spindle to hold said pawl element in position, said pawl element in its first cam position engaging said ratchet wheel to rotate the revolving element in one direction as the wheels rotate forward as the vehicle is advanced and to not rotate the revolving element in the opposite direction when the wheels are rotated in reverse, said pawl elements in its second cam position engaging said ratchet wheel to rotate the revolving element in the opposite direction when the wheels are rotated in reverse and to not rotate the revolving element in the one direction when the wheels are rotated forward as the vehicle is advanced, and said pawl element in its third cam position being in disengagement from said ratchet wheel so that the wheels of the vehicle rotate either forwardly or backwardly without rotation of the revolving element.

3,869,924

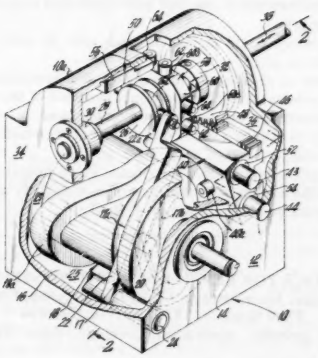
DEVICE FOR TRANSMITTING ACCURATE TRANSLATIONAL AND ROTARY MOVEMENTS

Earl F. Beezer, Hillsdale, N.J., assignor to Stelron Cam Company, Saddle Brook, N.J.

Filed Feb. 11, 1974, Ser. No. 441,489

Int. Cl. F16h *27/04*

U.S. Cl. 74—24 **12 Claims**



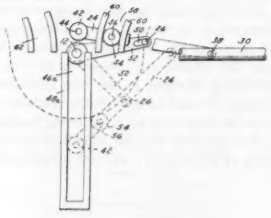
1. A motion transmitting device, comprising a rotary input shaft having rotary control cam means thereon, a rotary and axially movable output shaft having a pinion gear thereon, means supporting said input shaft for rotary movement and said output shaft for rotary and axial movement, a lever engaged with said cam means and said output shaft and being movable by said cam means to shift said output shaft axially, rotary drive means connected to said cam means and including a drive gear moved by said cam means engageable with said pinion gear to rotate said output shaft when it is in a predetermined axial position, said pinion gear being disengageable from said drive gear to permit axial movement without rotation, and holder means to hold said output shaft against rotation at positions of said output shaft when said pinion gear is out of engagement with said drive gear and to permit easy interengagement of said gears including at least one key elongated in the axial direction of said shaft and fixed in said housing and a control plate affixed to said shaft for rotation therewith having a plurality of circumferentially spaced pairs of transversely spaced guide rollers adapted to bear along respective sides of said key to hold the said output shaft in a fixed angular position during its linear movement.

3,869,925

HARMONIC TRAMMEL DRIVE

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed July 16, 1973, Ser. No. 379,375
Int. Cl. F16h 21/16
U.S. Cl. 74—25 10 Claims



1. In a trammel reciprocating drive of the type utilizing a drive shaft, an output member mounted for reciprocating lineal movement, a drive arm driven by said shaft, a link connecting said arm and said output member, and a primary stabilizer guide for one end portion of said link during an intermediate portion of the movement thereof in the course of a motion of 180° of said arm from one end dwell motion of said output member to another end dwell, that improvement which comprises:

a. secondary guide means on each side of said primary stabilizer guide,

b. means on said link to interengage said secondary guide means selectively near the respective ends of the reciprocal movement of said output member, and

c. means providing a slide connection between said arm and said link,

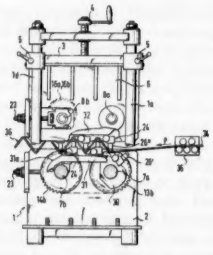
wherein a controlled dwell of said lineal output member at the end of a stroke thereof is materially increased during rotation of said drive shaft.

3,869,926

DEVICE FOR BENDING SERPENTINE STRUTS

Klaus Keller, Blumenstrasse 17, 8192 Geretsried, Germany

Filed Sept. 18, 1973, Ser. No. 398,414
Claims priority, application Germany, Sept. 21, 1972, 2246392
Int. Cl. F16h 21/16
U.S. Cl. 74—25 10 Claims



1. A device for bending serpentine struts, usable in lattice beams, from strand material, comprising:

two sets of bending tools between which the strand material passes for bending, said strand material defining a bending plane in which it travels in one direction through a bending zone;

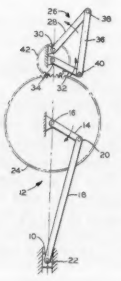
two chain pairs, each chain pair having two rotatable link chains each comprising a number of link members, the number of bending tools of a said set being only a fraction of the number of link members in a said chain, the chains of each chain pair being located in parallel side-by-side relation, each chain pair transversely and movably supporting the bending tools of a corresponding set for movement through said bending zone, said chains of each chain pair being rotatable in planes parallel to said bending plane, the chains of each pair being spaced on opposite sides of said bending plane and having opposed side surfaces which face each other, said bending tools of each set being supported between said spaced side surfaces of the corresponding pair of chains, said chains of each pair including inwardly extended opposed joint pins each having an end carried by the corresponding chain, a said bending tool being eccentrically pivoted on said extended joint pins.

3,869,927

GEARED DRAG LINK-SLIDER-CRANK PRESS

John G. Lose, Lansdowne, and John F. Roth, Boothwyn, both of Pa., assignors to Gulf & Western Industrial Products Company, Salem, Ohio

Filed Sept. 6, 1973, Ser. No. 394,914
Int. Cl. F16h 21/27
U.S. Cl. 74—44 14 Claims



1. A press comprising, frame means, a slide member supported in said frame means for reciprocating movement along a path between top dead-center and bottom dead-center positions, a toothed slide crank gear having an axis of rotation, a link member having opposite ends pivotally interconnected one with said slide member and the other with said slide crank gear at a pivot axis parallel to and spaced from said gear axis, whereby rotation of said slide crank gear about said gear axis imparts reciprocating movement to said slide member, second toothed gear means drivingly engaging said slide crank gear, said slide crank gear and second gear means having a ratio of rotation other than 1:1, and means for rotating said second gear means at a varying rotational speed, whereby said slide crank gear is rotated at a varying rotational speed.

3,869,928

UNIDIRECTIONAL ROTATION ACTUATOR

Akemi Ishii, Kawasaki, and Syotaro Suda, Yokohoma, both of Japan, assignors to Tokico Ltd., Kawasaki-ku, Kawasaki City, Japan

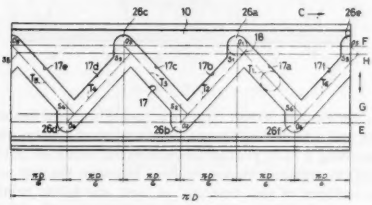
Filed Sept. 4, 1973, Ser. No. 393,833
Claims priority, application Japan, Sept. 5, 1972, 47-89005; Sept. 26, 1972, 47-96842; Sept. 27, 1972, 47-96791
Int. Cl. F16h 27/02
U.S. Cl. 74—88 3 Claims

1. A unidirectional rotation actuator comprising:

a cylinder of hollow cylindrical shape;

a piston fitted within the cylinder so as to be rotatable about and slidable along the axis of the cylinder relative thereto; means for driving the piston in reciprocating sliding motion relative to the cylinder in the axial direction thereof; said piston having an outer cylindrical surface facing the inner cylindrical surface of the cylinder, one of said surfaces having a cam groove therein of a zigzag shape including in continuous alternate combination, substantially straight groove parts of the same inclination in respectively different directions joined end-to-end at bends in the zigzag shape; and

a cam follower member fixed to and projecting from the other of said surfaces into engagement in the cam groove,



said cam groove having guide groove portions respectively provided at said bends, each of said guide groove portions being so shaped that, in concurrence with sliding in one direction of the piston relative to the cylinder, the cam follower member is permitted to advance further along the centerline of one straight groove part of the cam groove beyond the intersection of said centerline and the centerline of the succeeding adjacent straight groove part and, then, in concurrence with sliding of the piston in the direction opposite to said one direction, is permitted to undergo displacement in said sliding direction thereby to abut relatively against one wall surface of said adjacent straight groove part, and

said piston being intermittently rotated in each sliding motion in one direction and the reverse direction.

3,869,929

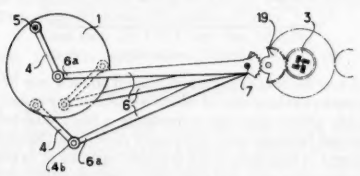
KINEMATIC TRANSMISSION DEVICES

Arduino Tosi, Route de Mions Toussieu. 69780, St. Pierre de Chandieu, France

Filed Dec. 10, 1973, Ser. No. 423,190

Int. Cl. F16h *27/00*

U.S. Cl. 74—112 **5 Claims**



1. A circular movement transmitting device comprising in combination:

a crank provided with a predetermined number of crank-pins angularly distributed in an adjustable manner,

a crank-arms articulated by their head on each of the crank-pins of the crank,

levers, one of the ends of which is rotatably connected to the base of the crank-arms, said levers each comprising between their ends a transverse boring which permits to said levers to oscillate around a same axle,

means controlled by said levers, said means being adapted to actuate unidirectional driving members wedged on a receiving shaft,

intermediate means adapted to amplify the amplitude of the oscillation of the ends of the levers which are opposite the ends articulated to the corresponding crank-arms,

motor means driving the crank,

a gear-train adapted to increase the rotary speed of the receiving shaft.

3,869,930

STEP-BY-STEP DEVICE FOR A RATCHET-WHEEL

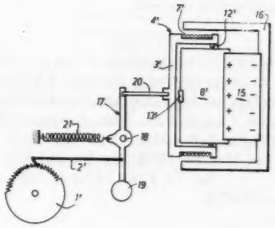
Edmond Forest, Saint-Nicolas-D'Aliermont, France, assignor to Societe Anonyme: Reveils Bayard, Saint-Nicolas D'Aliermont, France

Filed July 27, 1973, Ser. No. 383,064

Claims priority, application France, Dec. 20, 1972, 72.45349

Int. Cl. F16h *27/02*

U.S. Cl. 74—128 **10 Claims**



1. A step-by-step drive device for a ratchet-wheel acting through a pawl, said drive device comprising a movable cylindrical cup-shaped member having a closed end mechanically connected to the pawl, a coil connected to a source of electric pulses wound on said movable cup-shaped member, a cylindrical armature of a fixed ferrite core received in said cup-shaped member, said ferrite core forming an annular magnetic field surrounding said coil, a combined guide member and sealing ring for the cup-shaped member formed as a [toroidal] ring of low-friction[,] low-density material fixed to the cup-shaped member and defining a clearance of several microns between the cylindrical armature and the [cup-shaped] combined guide member and sealing ring, said combined guide member and sealing ring together with said cup-shaped member and said ferrite core defining a pneumatic dampening means for said cup-shaped member, a damping member interposed between the closed end of the cup-shaped member[,] and the circular front surface of the cylindrical armature, and resilient means for returning the cup-shaped member to its rest position.

3,869,931

TRACK ROLLER WITH REPLACEABLE AND REVERSIBLE FLANGES

Roger L. Boggs, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

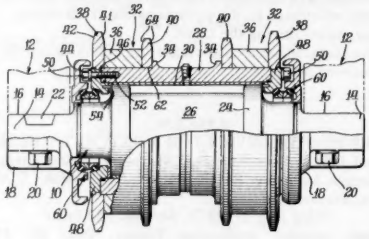
Filed Dec. 12, 1973, Ser. No. 424,095

Int. Cl. F16h *55/36;* **B62d** *55/00;* **F16c** *13/00*

U.S. Cl. 74—230.3 **5 Claims**

1. In a track roller assembly including a hub adapted to be journalled on a shaft and a pair of rims, one at each end of the hub and each including a radially outwardly facing annular tread and at least one radially outwardly extending annular flange adjacent the tread, the improvement wherein each of said hub, said treads and said flanges are separate parts and

wherein each flange is a symmetrical disc-like element whereby, after use and attendant wear, a flange may be re-



moved to be reversed and/or replaced without discarding the associated tread and/or the hub.

3,869,932

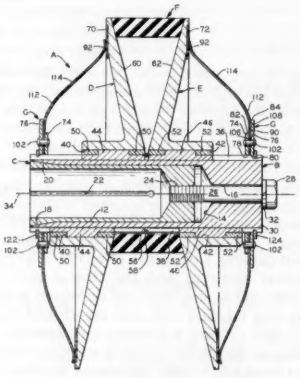
SPRING BIASED DOUBLE ACTING EXPANSIBLE PULLEY WITH INCREASED SPRING FATIGUE LIFE

Peter C. Fletcher, Chagrin Falls, Ohio, assignor to Speed Selector, Inc., Chagrin Falls, Ohio

Filed May 23, 1973, Ser. No. 362,904

Int. Cl. F16h *55/52*

U.S. Cl. 74—230.17 R **8 Claims**



1. In a variable pitch pulley having a pair of pulley halves relatively axially movable and resilient means for biasing said halves toward each other including a mounting member having an outermost edge and a surface facing axially toward one of said pully halves; and a plurality of radially extending leaf springs having an inner most mounting portion mounted against surface and an outer most portion bearing against one of said pulley halves and an intermediate flexing portion, the improvement which comprises: said axially facing surface extending radially outwardly beyond said outermost edge and said flexing portion diverging from said surface from a place radially inwardly of said outermost portion in a smooth tangent curve whereby the radially outermost place of engagement of said flexing portion with said surface moves radially outwardly as flexure occurs.

3,869,933

STRUCTURES OF REINFORCED ELASTOMERIC MATERIAL

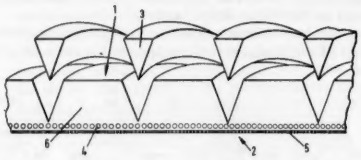
Marvin L. Dorf, Bleary-Lurgan, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 2, 1973, Ser. No. 412,072

Claims priority, application Great Britain, Nov. 14, 1972, 52640/72

Int. Cl. F16g *5/00*

U.S. Cl. 74—234 **10 Claims**



1. An endless V-belt structure having top and bottom surfaces and side driving faces extending therebetween, said belt comprising a body portion of elastomeric material and having a tension member therein midway between the top and bottom surfaces of said belt and at least one fabric reinforcing layer symmetrically positioned on each side of said tension member between said tension member and the top and bottom surfaces of said belt, said reinforcing layers having high compressive and tensile moduli in the transverse direction of the belt whereby the V-belt is of a symmetrical construction about said tension member.

3,869,934

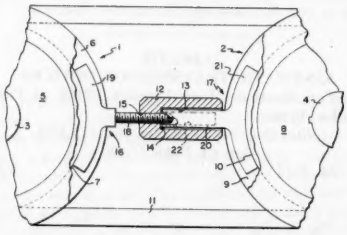
BELT TENSIONING TOOL

Philip F. Pierce, 4459 S. Kirk Rd., Vassar, Mich. 48768

Continuation-in-part of Ser. No. 169,320, Aug. 5, 1971. This application Sept. 12, 1973, Ser. No. 396,552

Int. Cl. F16h *7/10*

U.S. Cl. 74—242.12 **10 Claims**

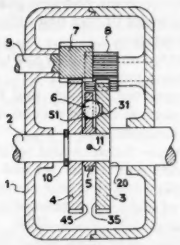


1. A tool for tensioning a belt trained about a pair of spaced apart pulleys at least one of which is movable toward and away from the other, said tool comprising a body adapted to be interposed between said pulleys and defining a chamber open at one end of said body and a threaded opening at its other end communicating with said chamber; a first member having one end thereof, rotatably and slidably accommodated in said chamber, bearing against said body, the other end of said first member extending outwardly from said one end of said body; a second member having a threaded shank at one end thereof accommodated in said opening and extending from said other end of said body into said chamber in sliding telescoping, relative rotating relation with said one end of said first member; and bearing means at other ends of said members for engagement with said pulleys, whereby rotation in one direction of said body, relative to said members effects elongation of said tool.

3,869,935
MECHANICAL DEVICE FOR CONVERTING A CONTINUOUS ROTARY MOTION INTO AN ALTERNATING ROTARY MOTION

Raymond Mathieu, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 19, 1973, Ser. No. 380,676
Claims priority, application France, July 21, 1972, 72.26419
Int. Cl. F16h *19/00, 27/00, 29/12*
U.S. Cl. 74—322 **6 Claims**



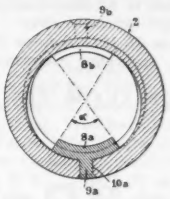
1. A mechanical device for converting a continuous rotary motion into an alternating rotary motion in reverse directions, comprising: a first and a second wheel parallel to each other and independently rotatable about a common axis said wheels having respective opposite faces located at a first predetermined distance from one another and being provided with respective recesses on said opposite faces; driving means for transmitting the rotation of one of said wheels to the other one in the reverse direction; a first shaft coupled to said driving means; a second shaft parallel to said common axis; a component located between said wheels and coupled to said second shaft for rotating about said common axis; and a coupling element carried by said component movable in relation thereto and at a second predetermined distance from said common axis for alternately engaging with the respective recesses of one or the other of said wheels; whereby, when one of said shafts is given a continuous rotary motion, the other one provides an alternating rotary motion in reverse directions according to which one of the wheels is coupled to said component by means of said coupling element.

3,869,936
MECHANISM FOR CONVERTING A MOVEMENT OF TRANSLATION INTO A ROTATIONAL MOVEMENT, AND VICE VERSA

Jacques Taillardat, Saint Alban En Leysse, France, assignor to La Technique Integrale, Chambery, France

Filed Oct. 23, 1973, Ser. No. 408,361
Claims priority, application France, Oct. 20, 1972, 72.37323
Int. Cl. F16h *55/04*
U.S. Cl. 74—459 **7 Claims**

1. In a re-circulating ball, screw-and-nut device including screw and nut members which each have defined in its mating surface a helical groove, said members when in cooperating relationship defining between them a helical passage of generally circular cross section formed by said grooves with a train of balls situated and movable in said passage, whereby rotary movement of one of said members relative to the other causes axial movement of the other, the improvement in combination therewith wherein said nut member comprises a cylinder whose wall has opposite first and second ends, and extending within said wall is a ball re-circulation passage the ends of which open into the helical groove of said nut member respectively at a first ball-extraction point axially inward of said first end and at a second ball re-introduction point axially inward of said second end, the device further comprising at least one coupling member extending from said nut member into said passage, said coupling member having a cross section closely corresponding to that of said passage and being situated axi-

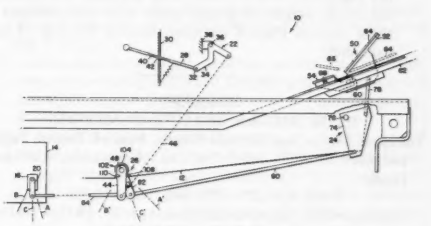


ally outward of one of said first and second points, and means extending from said nut member into said passage and adjacent one of said points for deflecting said balls from said helical passage into said re-circulation passage.

3,869,937
INTERLOCKED HAND-AND FOOT-OPERABLE ENGINE SPEED CONTROL

Barry Louis Ahrens, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 7, 1974, Ser. No. 448,909
Int. Cl. G05g *11/00*
U.S. Cl. 74—482 **5 Claims**

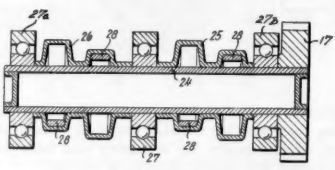


1. An output linkage for transferring a first input to a controlled device for selecting a desired operating condition of the device, for transferring a second input to the controlled device for overriding the condition set by the first input and for automatically returning the device to said desired operating condition once a force initiating and second input is removed, comprising: first, second and third arms mounted for swinging movement about a first axis, the arms being grouped together with the third arm being located between the first and second arms; first input means connected to said first arm for selectively swinging the latter about said axis to and for fixing the latter in selected positions; second input means connected to said second arm and link means connecting the second arm to said controlled device; said second input means connected for floating movement with said second arm when the latter is swung to adjust the controlled device in response to the first arm being swung to a selected position by said input means and for selectively swinging said second arm independently of said first arm to adjust the device so as to override the setting thereof determined by said first input means; said first and second arms having respective stop portions disposed for abutting said third arm; spring means resiliently interconnecting said first, second and third arms and biasing said first and second arms in a first direction about said axis and biasing said third arm in an opposite second direction about said axis to thereby yieldably hold said first and second arms in abutting engagement with said third arm.

3,869,938
CAM SHAFT FOR RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

Heinz Schlotterbeck, and Walter Staake, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed June 27, 1973, Ser. No. 373,981
Claims priority, application Germany, July 1, 1973, 2232438
Int. Cl. F16h *53/00*
U.S. Cl. 74—567 **8 Claims**



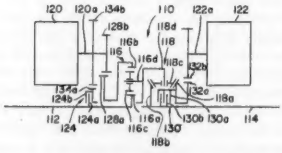
1. A cam shaft, especially for internal combustion engines comprising:

a cylindrical steel pipe having axial regions thereof expanded radially to form eccentric cam portions, and a cylindrical reinforcing element coaxially disposed inside said steel pipe and having the radially outer surface thereof in supporting engagement with the cylindrical inner surface of said steel pipe on opposite axial sides of the respective said eccentric cam portions, and counterbalancing weights disposed inside said cam portions in those regions thereof disposed nearest the axis of said cam shaft.

3,869,939
HYDROMECHANICAL TRANSMISSION

Takayuki Miyao, and Hiroaki Maeda, both of Toyota, Japan, assignors to Aisin Seiki Co. Ltd., Kariya-shi, Aichi-ken, Japan

Filed Apr. 27, 1973, Ser. No. 354,956
Claims priority, application Japan, Apr. 28, 1972, 47-42863
Int. Cl. F16h *47/04, 37/08*
U.S. Cl. 74—687 **3 Claims**



1. A hydromechanical transmission comprising:

an input rotary shaft;

an output rotary shaft;

a pair of variable volume hydrostatic pump-motors being interconnected with each other through means of a closed hydrostatic circuit;

a first differential gear set having a first gear element connected with said input rotary shaft, a second gear element, and a third gear element connected with said first and second gear elements thereof;

a second differential gear set having a first gear element connected with said output rotary shaft, a second gear element, and a third gear element connected with said first and second gear elements thereof and to said third gear element of said first differential gear set;

a first gear connected with said second gear element of said first differential gear set for rotation therewith;

a second gear mounted on the rotary shaft of one of said hydrostatic pump motors and connected with said first gear for rotation therewith;

a third gear mounted on said rotary shaft of said one of said hydrostatic pump motors;

a fourth gear rotatable with said third gear;

first clutch means between said fourth gear and said input rotary shaft for coupling said first gear element and said second gear element of said first differential gear set for simultaneous rotation;

a fifth gear mounted on the rotary shaft of the other of said hydrostatic pump motors;

a sixth gear connected between said fifth gear and said second gear element of said second differential gear set for rotation therewith; and

second clutch means between said second gear element of said second differential gear set and said output rotary shaft for coupling said first gear element and said second gear element of said second differential gear set for simultaneous rotation.

2. A hydromechanical transmission comprising:

an input rotary shaft;

an output rotary shaft;

a pair of variable volume hydrostatic pump-motors being interconnected with each other through means of a closed hydrostatic circuit;

a first differential gear set having a first gear element connected with said input rotary shaft, a second gear element connected with one of said hydrostatic pump-motors, and a third gear element connected with said first and second gear elements thereof;

a second differential gear set having a first gear element connected with said output rotary shaft, a second gear element connected with the other of said hydrostatic pump-motors, and a third gear element connected with said first and second gear elements thereof;

an intermediate rotary shaft supporting said third gear element of said first differential gear set on one end and said third gear element of said second differential gear set on the other end thereof;

a first gear on said intermediate rotary shaft;

a second gear connected with said first gear for rotation therewith;

first clutch means between said second gear and said input rotary shaft for coupling said first gear element and said third gear element of said first differential gear set; and

second clutch means between said second gear and said output rotary shaft for coupling said first gear element and said third gear element of said second differential gear set.

3. A hydromechanical transmission comprising:

an input rotary shaft;

an output rotary shaft;

a pair of variable volume hydrostatic pump-motors being interconnected with each other through means of a closed hydraulic circuit;

a first differential gear set having a first gear element connected with said input rotary shaft, a second gear element connected with one of said hydrostatic pump-motors, and a third gear element connected with said first and second gear elements thereof;

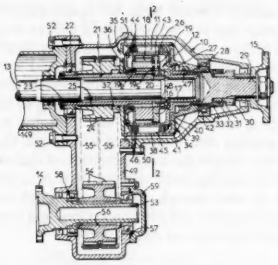
a second differential gear set having a first gear element connected with said output rotary shaft, a second gear element connected with said one of said hydrostatic pump-motors, and a third gear element connected with said first and second gear elements thereof and to said input rotary shaft;

a first gear on said input rotary shaft;

first clutch means for coupling said first gear to the other of said hydrostatic pump-motors;

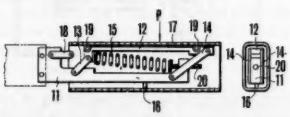
a second gear on said output rotary shaft;
second clutch means for coupling said second gear to said other of said hydrostatic pump-motors;
third clutch means between said second gear element of said first differential gear set and said one of said hydrostatic pump-motors; and
fourth clutch means between said second gear element of said second differential gear and said one of said hydrostatic pump-motors.

3,869,940
VEHICLE WITH DIFFERENTIAL ASSEMBLY
Oswald Webb, Whitley, and Brian Colin Pagdin, Sutton Coldfield, both of England, assignors to GKN Transmission Limited, Birmingham, England
Filed Jan. 8, 1973, Ser. No. 321,572
Claims priority, application Great Britain, Jan. 7, 1972, 721/72
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 **13 Claims**



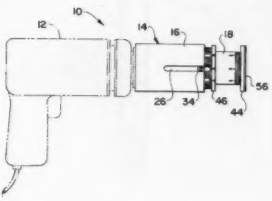
1. A vehicle including a prime mover, axles or axle parts drivable by the prime mover, a three-member differential gearing of epicyclic type including planet elements mounted in a planet carrier, a control coupling connected between two-members of the gearing to control relative rotation between said members, the coupling including first and second elements relatively rotatable in a viscous fluid having a viscosity of between 1,000 and 100,000 centistokes at 20°C with a zero shear rate about a common axis, the elements being annular and spaced from said axis to provide a space thereabout and said differential gearing being located in said space, driving connections between the first and second elements respectively and two members of the differential gearing, and further driving connections between the vehicle prime mover and one member of the gearing and between the other members of the gearing respectively and either the parts of a single driven axle or two driven axles.

3,869,941
TORQUE WRENCH
Hiroshi Tsuji, Tokyo, Japan, assignor to Tonichi Manufacturing Co., Ltd., Tokyo, Japan
Filed May 22, 1974, Ser. No. 472,369
Claims priority, application Japan, Aug. 29, 1973, 48-97029
Int. Cl. B25b
U.S. Cl. 81—52.5 **3 Claims**



1. Preset type torque wrench having a toggle mechanism therein, wherein the improvement comprises a head rod secured to the torque applying head of said wrench, a slide rod arranged in parallel to said head rod, two pairs of toggle links arranged in spaced relationship from each other lengthwise of said head rod and said slide rod adjacent to the opposite ends of said slide rod and each pivotally connected to said head rod and said slide rod, and a spring interposed between said head rod and said slide rod and connected thereto.

3,869,942
DRIVING TOOL
Charles J. DeCaro, Brighton Township, Beaver County, Pa., assignor to Textron Inc., Providence, R.I.
Filed Feb. 4, 1974, Ser. No. 439,033
Int. Cl. B25b *13/00, 21/00*
U.S. Cl. 81—54 **13 Claims**

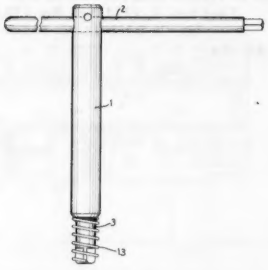


1. An adapter for a fastener driving tool in which a clutch mechanism is operable therebetween comprising:
A. a housing adapted for securement to the driving tool;
B. a main body having an opening therethrough slidably positioned within the housing and adapted for engagement with a workpiece and for extensible movement from the housing;
C. a wrenching mechanism positioned within the main body opening including a forward fastener engaging end and a rearward clutch engaging end and an annular groove thereabout intermediate said ends; and
D. a detent assembly operative between the main body and the groove in the socket member so that as the main body is urged from an extended position into the housing, the detent engages the groove to move the socket member into engagement with the clutch mechanism and continued movement of the main body into the housing causes the detent to override the groove and move relative to the wrenching mechanism.

3,869,943
SELF-EJECTING CHUCK KEY
James R. Buck, Ross Twp., Mich., assignor to Buck Tool Company, Kalamazoo, Mich.
Filed July 19, 1973, Ser. No. 380,669
Int. Cl. B25b *13/02*
U.S. Cl. 81—90 A **1 Claim**

1. A self-ejecting chuck key adapted for introduction into a mating opening within the operating mechanism of a chuck, said key comprising:
a substantially cylindrical shank portion adapted to have a transversely extending handle fixedly or removably connected to one end thereof;
a cylindrical nose portion projecting outwardly from and fixedly connected to the other end of said shank portion, said nose portion having a diameter which is substantially smaller than the diameter of said shank portion;
said nose portion having a plurality of flats formed thereon adjacent the free end thereof, said flats resulting in said nose portion having a noncircular part adjacent the free end thereof which is adapted to be inserted into the mating opening within the operating mechanism of a chuck;
a tapering and generally conical connecting portion fixedly connecting said shank portion and said nose portion, said connecting portion tapering outwardly in a

diverging manner as it extends in a direction from said nose portion toward said shank portion, said connecting portion having an annular groove formed therein and encircling same, said annular groove being spaced intermediate the ends of said connecting portion and resulting in the formation of an annular tapered projection positioned between said groove and said cylindrical nose portion, said annular projection having a diameter greater than the diameter of said cylindrical nose portion; and



a standard coil spring having coils of uniform diameter encircling said nose portion over substantially the entire length thereof, one end of said coil spring being disposed at a point at least closely adjacent the free end of said nose portion, and the other end of said spring having an end coil thereof disposed within said groove for fixedly anchoring said other end of said spring.

3,869,944

OPEN CLAMP WITH MEANS FOR CLOSING THE BAND ENDS

Hans Detiker, 21, Oberdorfstrasse, Horgen, Switzerland

Filed Apr. 10, 1973, Ser. No. 349,696

Claims priority, application Switzerland, Apr. 11, 1972, 5273/72; Aug. 9, 1972, 11743/72

Int. Cl. B65d *63/02*

U.S. Cl. 81—9.3 **29 Claims**

1. A clamp for clamping a hose onto a nipple by means of an open band adapted to be closed, said band being provided with perforation apertures in the upper band end and with barbs in the lower band end which engage in the perforation apertures when the band is placed about the hose, further perforation apertures being also provided in the lower band end, and a slot being provided in the upper band end within the area of the further perforation apertures, characterized in that the boundary wall of said slot is provided with an upset portion within the area of its surface pointing away from the upper end of the band.

3,869,945

SOCKET WRENCH HEAD FOR SPARK PLUGS

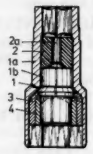
Hermann Jochen Zerver, Reinshagener Str. 2, 5630 Remscheid, Germany

Filed Aug. 21, 1973, Ser. No. 389,652

Claims priority, application Germany, Aug. 22, 1972, 72309796

Int. Cl. B25b *13/06, 13/48*

U.S. Cl. 81—125 **7 Claims**



1. A socket wrench head for spark plugs with terminals, which comprises in combination: a socket wrench head body having a hollow shank, and also having a first end portion for engagement with means for actuating said wrench head body and also having a second end portion axially opposite said first end portion for receiving the spark plug to be handled, said shank being located between said first and second end portions, a guiding sleeve arranged within said shank and having a bore extending in the axial direction of said shank for receiving and embracing only the terminal of a spark plug to be handled by said wrench, and a permanent magnet arranged within said second end portion for holding a spark plug introduced into said second end portion.

3,869,946

REPRODUCTION LATHE

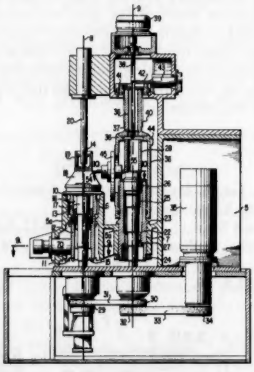
Jean-Pierre Vignaud, and Bernard Leguy, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 10, 1974, Ser. No. 432,234

Claims priority, application France, Mar. 15, 1973, 73.09335

Int. Cl. B23b *3/28*

U.S. Cl. 82—14 R **21 Claims**



1. Reproduction lathe for the machining of articles by tool means having associated therewith sensing means for engaging a reproduction template comprising:

a framework upon which are rotatably mounted two parallel spindles for respectively carrying said article to be machined and said reproduction template;

a machining sheath carriage disposed about said template spindle, which is translatably movable along and rotatably movable about its longitudinal axis;

at least one support means detachably mounted upon said sheath so as to extend perpendicular to the axes of said spindles; and

tool means disposed exteriorly of said sheath and sensing means disposed interiorly of said sheath, said tool and sensing means being secured to said support means at opposite ends thereof,

whereby said tool means is simultaneously moved in accordance with the translatable movement of said sheath and the relative oscillating movement resulting from the action of said reproduction template upon said sensing means with which said sensing means is engaged.

3,869,947

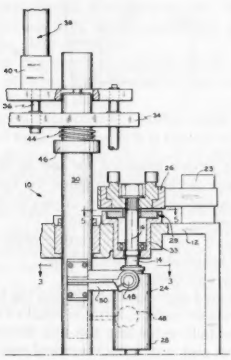
PISTON TURNING MACHINE

John Vandenkieboom, St. Clair Shores, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.

Filed Aug. 20, 1973, Ser. No. 389,483

Int. Cl. B23b *3/28*

U.S. Cl. 82—19 **2 Claims**



1. Apparatus for machining piston skirts to a predetermined cross-sectional shape comprising:

a. an elongated rotable shaft having an axis,

b. means for supporting a piston having a skirt to be machined on one end of said shaft so that the axis of said skirt is substantially coincident with said shaft axis,

c. cam means intermediate the ends of said shaft corresponding in cross-sectional shape to said predetermined cross-sectional shape, said cam means having a diameter not substantially greater than the diameter of the piston, said cam means having an external surface and an axis substantially coincident with said shaft axis,

d. a support bar having a longitudinal axis spaced from said shaft axis, said support bar being mounted for movement substantially parellel to said shaft axis,

e. a turning tool secured to said bar and extending toward said shaft axis for engagement with the skirt of a piston on said support means, and

f. cam follower means secured to said bar and engaged with said cam means, said cam follower means engaging said cam means at a point which is a certain distance from a line extending between said support bar axis and said shaft axis, and said turning tool engaging said piston at a point which is a distance from said line less than said certain distance, and bearing means supporting said shaft at a position spaced from said cam means, said bearing means being movable transversely of said shaft for deflecting said cam means.

3,869,948

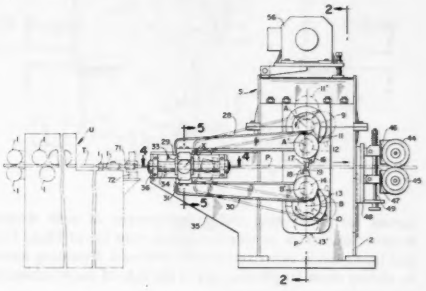
SHEAR APPARATUS

Robert J. Rau, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed Mar. 7, 1974, Ser. No. 448,888

Int. Cl. B26d *1/40, 1/56, 5/40*

U.S. Cl. 83—286 **20 Claims**



18. Flying shear apparatus for cutting an elongated workpiece as it moves in a predetermined path of travel, comprising two crankshafts rotatably mounted about axes on opposite sides of said path of travel, each of said crankshafts having a crank pin offset from the axis of rotation of said crankshaft, the off-set distances being substantially equal for both crankshafts, a blade holder carrying a cutting blade rotatably mounted on the crank pin of each of said crankshafts, means actuated by movement of a predetermined length of said workpiece for rotating said crankshafts in opposite angular directions as said cutting blades approach in cutting relation to cut said workpiece and separate, a tubular guide member rigidly mounted about the path of travel of said workpiece so said workpiece passes through said guide member and is guided by it, a movable supporting member slidably mounted on said tubular guide member to support it for movement in a path parallel to said workpiece, and a pair of link members each of which is rigidly connected at one of its ends to one of said blade holders and at its other end is pivotally connected to said movable supporting member.

3,869,949

SHEAR APPARATUS WITH IMPROVED BLADE HOLDING MEANS

David E. Dolle, Youngstown, Ohio, assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

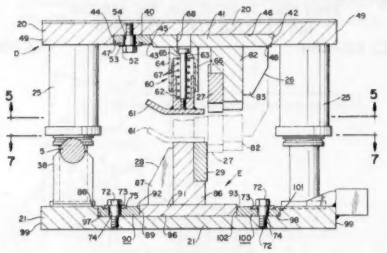
Filed Feb. 27, 1974, Ser. No. 446,166

Int. Cl. B23d *25/04;* **B26d** *1/56*

U.S. Cl. 83—320 **14 Claims**

1. In a machine of the character described, an upper platen having an upper supporting member mounted thereon, a lower platen having a lower supporting member mounted therein in vertical alignment with said upper supporting member, means for causing relative vertical movement of said platens toward and away from each other, a removable elongated top blade holder and top blade rigidly mounted on said upper supporting member, spaced shoulders in the upper portion of said lower supporting member having parallel side faces, a mounting member and a pair of elongated wedges mounted in the space between said shoulders for sliding movement lengthwise toward one side of the machine, a removable elongated lower blade holder and lower blade rigidly mounted on said mounting member, said wedges being mounted on opposite sides of said mounting member and having outer side surfaces slidably engaging said side faces of said shoulders and flat tapered inner side faces slidably engaging the side faces of said mounting member, said tapered side faces having the

same amount of taper and being adapted to position said lower blade parallel to said top blade when the two wedges are forced against said mounting member and against the side faces of said shoulders, releasable hold-down means for clamping each wedge in its adjusted position, and releasable



means for preventing sliding movement of said mounting member out of its adjusted position, said lower blade holder and lower blade being removable with said mounting member by sliding them lengthwise out of the side of the machine after said wedges are loosened.

3,869,950

APPARATUS FOR TRANSVERSE CUTTING OR PERFORATING A CONTINUOUSLY ADVANCING WEB

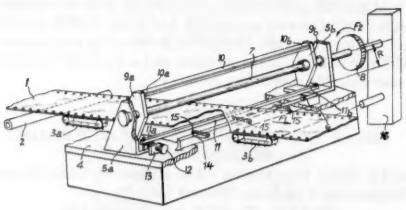
Arthur Bienvenu Dalla Serra, Aulnay sur Bois, France, assignor to Societe Herve & Fils, Papeteries du Sentier (Societe Anonyme), Paris, France

Filed Mar. 7, 1973, Ser. No. 338,659

Claims priority, application France, Mar. 7, 1972, 72.07826; Feb. 19, 1973, 73.05792

Int. Cl. B26f *1/00*; **B41g** *1/00*

U.S. Cl. 83—341 **8 Claims**



1. An apparatus for performing periodic, sequential penetrations in a continuously advancing material web, comprising:

a. a supporting frame including first drive means for the material web;

b. a transversely extending assembly pivotally mounted on said supporting frame and including:

1. laterally associated bracket members;

2. a straight shaft extending between and associated with the bracket members, said shaft being positioned parallel to the plane of the material web and further having an axis of rotation and provided with second drive means;

3. a straight-edged rotatable cutter blade having a cutting edge and mounted on and rotatable about said shaft in parallelism to said axis of rotation so that, when rotated, the cutting edge generates a rectangular cylinder of revolution; and

4. a flexible straight-edged counterblade having a cutting edge including terminal end points and being held in its operative position solely by attachment of said end points to said bracket members and at an angle with respect to said axis of rotation and in such a position that at least said two end points of the cutting edge of the counterblade always lie on the surface of said cylinder of revolution, that portion of said counterblade between said end points being free of support; whereby during operation of the apparatus, the cutting edge of the counterblade cooperates with the cutting edge of the rotatable blade to perform the periodic, sequential penetrations of the material web and the flexibility of the counterblade alone permits the passage of the rotating blade beyond the counterblade.

3,869,951

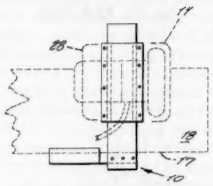
PORTABLE POWER SAW GUIDE

William J. Litwin, 323 Church St., Newington, Conn. 06111

Filed Oct. 16, 1973, Ser. No. 406,968

Int. Cl. B27b *9/04*

U.S. Cl. 83—745 **1 Claim**



1. A guide device intended for use as an accessory for a portable power circular saw to guide the saw squarely across a piece of lumber being cut in a cross cut manner, the guide device comprising, in combination:

a square unit and a saw mounting plate unit reciprocally slidable longitudinally therealong;

said square unit comprising:

an elongated rectangularly shaped leg having a flat vertical interior surface, a flat vertical exterior surface, flat horizontally extending top and bottom edges, a front vertical end, and a back vertical end;

a flat rectangularly shaped elongated guide member generally of a board shape and having a flat horizontally extending top surface, a flat horizontally extending bottom surface, opposed flat parallely extending side edges, and opposed front and back edges;

fastening means affixing said back end edge of said guide member to said back end portion of said top edge of said leg with said guide member overlapping said leg and said guide member extending outwardly of the interior surface of said leg at a ninety degree engle thereto;

a flat elongated rectangularly shaped lip forming member having a flat horizontal top surface, a flat horizontal bottom surface, transversely opposed longitudinally extending parallel side edges, and longitudinally spaced apart transversely extending front and back edges;

fastening means affixing said lip forming member to said top edge of said leg extending longitudinally therealong with said lip forming bottom surface in juxtaposition with said leg top edge, the lip forming member extending outwardly over the interior surface of said leg member to overlap the same and form a horizontal lip therewith which extends at a ninety degree angle to the interior surface of the leg member;

said plate unit comprising:

a flat rectangularly shaped plate member having a flat smooth horizontal top surface, a flat horizontal bottom surface, opposed parallel side edges, and opposed parallel front and back edges;

a pair of centrally spaced longitudinally spaced apart apertures extending through said plate member;

a pair of mounting bolts, each bolt associated with one of said plate member apertures and adapted to pass therethrough for detachably securing said plate member to a base portion of the portable power circular saw with the side edges of the plate member extending parallel to the plane defined by the circular blade of the circular saw;

a pair of transversely spaced apart longitudinally extending gib members each of an elongated rectangular shape with each extending along an opposite side edge of said plate member between opposite end edges thereof and in juxtaposition with the flat bottom surface thereof;

the spacing between interior confronting side edges of said gib members being slightly greater than the width of said guide member of said square unit;

the thickness of each of said gib members being identical to each other and being slightly greater than the thickness of said guide member of said square unit;

a pair of flat elongated rectangularly shaped holding members each extending along a bottom surface of one of the gib members longitudinally of the plate member and overlapping the interior side edges of the gib members such that a pair of grooves having a generally U-shaped cross-sectional configuration are defined between the gib members, holding members, and bottom surface of the plate member;

means disposed at spaced intervals along the side edges of the plate member and affixing the gib member and said holding member thereto;

said plate unit being reciprocally slidable along said guide member of said square unit which is movably received in said plate unit grooves so that when said square unit guide member is positioned against an upper surface of the piece of lumber to be cut with said square unit leg positioned alongside said piece of lumber with said lip member resting on said upper side of said lumber and said leg interior surface engaging the adjacentmost edge of said piece of lumber then the saw secured to the edge unit is guided thereby in a manner normal to the longitudinal axis of the wood to provide an accurate cross-cut of the wood.

3,869,952

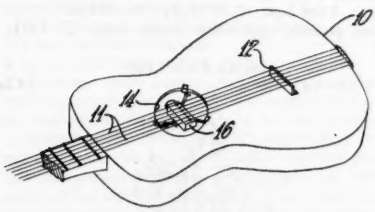
PICKUP MOUNT FOR STRINGED MUSICAL INSTRUMENTS

Horace N. Rowe, Rt. 5, Box 158, Swanton, Ohio 43558

Filed Mar. 20, 1974, Ser. No. 452,738

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.16 **15 Claims**



1. In combination with a stringed musical instrument having a hollow instrument chamber and an opening in the chamber wall underlying the strings;

means for support of a pickup for the musical output of the instrument under said strings within the space transverse to the perimeter of said opening,

said support means comprising a platform having legs extending therefrom establishing engagement with the chamber wall edge at regions spaced about the perimeter of said opening for support of said platform below said strings.

3,869,953

TUNING PIN FOR PIANO

Horoshi Tatebe, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Continuation of Ser. No. 278,010, Aug. 4, 1972,. This application Dec. 17, 1973, Ser. No. 425,222

Claims priority, application Japan, Aug. 5, 1971, 46-70185

Int. Cl. G10c *3/10*

U.S. Cl. 84—201 **4 Claims**

1. A plurality of tuning pins for a piano,

a. each of said pins essentially consisting of an elongated body having a longitudinal axis and two longitudinally spaced end faces transverse to said axis,

b. said body being formed with a bore diametrically therethrough adjacent one of said faces and remote from the other face,

c. a first portion of said body being axially defined by said bore and said one end face,

d. a second portion of said body being axially defined by said bore and said other end face,

e. said one end face carrying an elongated index mark extending across said one end face transversely of said axis and indicative of the angular position of said bore relative to said axis,

f. the spatial relationship of said bore and of said index mark being the same in each of said pins,

g. said second portion carrying threads about said axis.

3,869,954

STRINGED INSTRUMENT

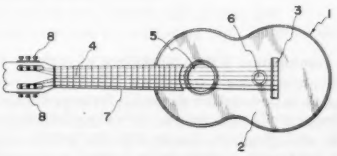
Testuo Ito, 5-5-22, Shimo-Hoya, Tokyo, Japan

Filed July 31, 1974, Ser. No. 493,605

Claims priority, application Japan, Oct. 16, 1973, 48-119951

Int. Cl. G10d *3/00*

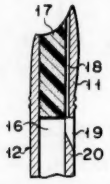
U.S. Cl. 84—291 **5 Claims**



1. In a stringed instrument comprising a resonance body having a sound board provided with a sound hole and a bridge for fastening a string; and a neck secured to said resonance body at the lower end thereof and provided with a peg for straining and loosening said string at the upper end thereof; the improvement characterized in that two sound holes of substantially circular shapes are provided on said sound board

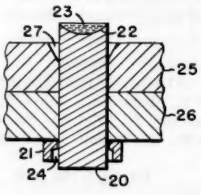
at positions under said string; and that the diameter of the first sound hole is two times as long as that of the second hole.

3,869,955
RECORDER
Mitsuo Yamaguchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed Oct. 19, 1973, Ser. No. 407,916
Claims priority, application Japan, Oct. 30, 1972, 47-124328
Int. Cl. G10d 7/00
U.S. Cl. 84—380 4 Claims



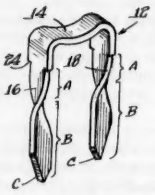
1. A recorder having within a mouthpiece a block for forming a wind channel, said block being made of a plastic material having a plurality of intercommunicating cells.

3,869,956
PIN ASSEMBLY RIVET
Robert A. Breer, Nashville, Tenn., assignor to Avco Corporation, Nashville, Tenn.
Filed Apr. 2, 1973, Ser. No. 347,178
Int. Cl. F16b 19/06
U.S. Cl. 85—37 1 Claim



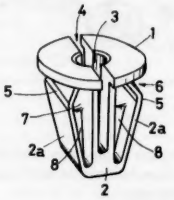
1. In combination with a workpiece of metallic material, said workpiece having a cylindrical hole therethrough and a countersink in one surface thereof, a fastener comprising:
a cylindrical pin of titanium alloy extending through said hole, said alloy being harder than the metallic material of said workpiece, a cavity being formed in one end of said pin on the axis thereof,
a hydraulic fluid medium in said cavity, said pin being upsettable by axial forces so applied that the fluid forces the cavity end of said pin radially to expand and descend into said countersink, and
a collar formed with a radial relief and frictionally engaging the end of said pin opposite to said cavity end so that said axial forces extrude a marginal portion of said opposite end of said pin into said radial relief.

3,869,957
SELF-CLINCHING STAPLE
Gerald Dean Barth, Dundee, and John Bert Alexander, Wheeling, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 23, 1973, Ser. No. 408,393
Int. Cl. F16b 15/00
U.S. Cl. 85—49 6 Claims



1. A one-piece self-clinching staple of metallic flat wire stock including a transverse bight section, and an elongate leg section forming an integral continuation of said bight section at each extremity thereof, each of said leg sections extending downwardly from said bight section and lying in a plane substantially normal with respect thereto, said leg sections including entering and trailing portions each including wider surfaces and narrow, longitudinally extending edge surfaces, said trailing portions being in the vicinity of said bight section and comprising a portion extending substantially in a straight line with the wider surfaces thereof in faced parallel relation, the portion of each leg section extending axially beyond said trailing portions being twisted about its longitudinal axis in such a direction as to provide an entering portion with the wider surfaces thereof lying in a common longitudinal plane substantially normal to the longitudinal planes defined by the wider surfaces of said trailing portions and to the transverse bight section, the free end of the entering portion including a relatively sharp point to facilitate initial penetration of a work-sheet, said point being formed by a pair of said longitudinally extending side edge surfaces terminating at an apex, one of each pair of edge surfaces extending for a greater axial distance from the apex at an angle to the plane of the trailing portion than the other of said pair of side edge surfaces to provide a cam surface for effecting automatic clinching movement of said leg sections when driven through a work sheet.

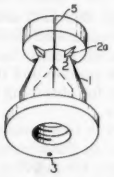
3,869,958
SCREW GROMMET
Hiroo Murayama, Tokyo, Japan, assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Sept. 13, 1972, Ser. No. 288,625
Claims priority, application Japan, Sept. 13, 1971, 46-82566
Int. Cl. F16b 13/08
U.S. Cl. 85—80 2 Claims



1. A one piece plastic anchor device for application to a non-circular apertured workpanel to accommodate a threaded shank of a screw member, said anchor member

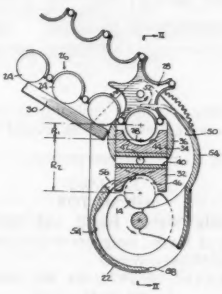
including a head section providing a surface for clampingly engaging one side of the workpanel and a tapered shank section extending longitudinally from said head section, said head and shank sections being bifurcated by a common slot which extends through said head into said shank to a point adjacent the free end of said shank defining a pair of shank sections where said shank sections are integrally joined, each of said shank sections including an inner wall extending from the head to the free end and having a central screw receiving axially extending groove which extends through each section of said head and an outer wall spaced from the inner wall also extending from the head to the free end and which is tapered outwardly from the free end to an intermediate point spaced from said head to define an impositive shoulder for initial engagement with the opposite surface of said workpanel, said outer walls over a limited axial extent thereof between said head and a transverse plane axially spaced below said shoulder being flexible toward one another so that insertion of the fastener into any one of a plurality of different sized apertured workpanels will flex said outer wall inwardly to form a positive shoulder for retention and integrally connected rigid reinforcing means extending radially from each inner walls to the adjacent outer walls and further extending axially from said free end to said transverse plane axially spaced from said shoulder to reinforce said outer wall and adapted to reinforce said positive shoulder by strut action when a screw is introduced into said groove and expands the shank sections.

3,869,959
FASTENER DEVICE
George A. Moen, 827 W. 26th Ave., Anchorage, Alaska 99503
Filed Apr. 26, 1973, Ser. No. 354,595
Int. Cl. F16b *13/04*
U.S. Cl. 85—83 **3 Claims**



1. An expansible self-locking fastener member adapted for mounting in a hole of given diameter contained in a support, comprising a unitary resilient fastener member (1) including
a. a cylindrical body portion (1*a*) the outer diameter of which corresponds with the hole diameter;
b. said body portion containing at one end:
1. a threaded bore (4); and
2. an external flange portion (1*b*);
c. a cylindrical collar portion (1*c*) spaced from the other end of said body portion, said collar portion having external diameter which equals that of the body portion;
d. a tapered neck portion (1*d*) of progressively reduced outer diameter connecting said collar and body portions, said neck portion containing a chamber (4*a*) in communication at one end with the adjacent end of said threaded bore, said chamber being convergent in the direction of said collar portion;
e. said collar and neck portions containing at least one longitudinally extending slit to permit the radial outward expansion thereof; and
f. rib means arranged on the exterior surface of at least one of said body and neck portions for preventing rotation of said fastener means relative to said support, said rib means including a plurality of first ribs arranged in circumferentially spaced relation on said neck portion at the juncture thereof with said collar portion, said first rib means also being connected with said collar portion, whereby upon introduction of the collar and neck portions of the fastener member into the hole in said support and the introduction of a threaded locking member into the threaded bore of said bylindrical portion and at least partially within said neck portion, said collar portion is expanded radially outwardly into tight frictional engagement with the adjacent wall surface of said hole.

3,869,960
ACCELERATOR
Burton Parker Clark, St. George, Vt., assignor to General Electric Company, Burlington, Vt.
Filed Feb. 8, 1973, Ser. No. 330,601
Int. Cl. F41d *9/06*
U.S. Cl. 89—33 CA **4 Claims**

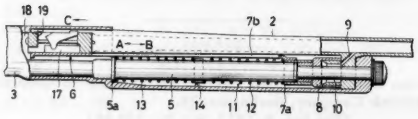


1. An accelerator for a train of articles comprising:
a first article conveyor for conveying articles at a first velocity;
a second article conveyor for carrying articles at a second velocity;
an intermediate shuttle having two article receiving cups mutually spaced 180° apart, each for receiving, in alternation, an article from said first conveyor at said first velocity and for delivering such article to said second conveyor at said second velocity;
said shuttle being journalled for rectilinear movement in a guide which is journalled for rotation about a fixed intermediate axis; and
control means coupled to said shuttle and to said guide for causing said guide to rotate about said intermediate axis and said shuttle to move rectilinearly in said guide;
said guide being a hub having a transverse slot;
said shuttle being disposed in and reciprocating along said slot; and
said control means includes:
a rectilinear cross slot in said shuttle, and
a stationary cam rod extending into said cross slot.

3,869,961
ACTION SPRING ASSEMBLY FOR FORWARDLY URGING THE ACTION BAR OF SHOTGUNS
Takeji Kawamura, 1388-1 Akahane, Ishinazaka-cho, Hitachi-shi, Ibaragi-ken, Japan
Filed Mar. 19, 1973, Ser. No. 342,599
Int. Cl. F41d *5/04*
U.S. Cl. 89—191 A **3 Claims**

1. In a spring assembly returning an action bar to its original position which has been moved in one direction by a piston, the improvement comprising a pair of coil springs arranged in a row and a shock absorbing member interposed between said coil springs to buffer the force applied to one spring and to transmit the buffered force to the other spring, said shock

absorbing member having first and second rings arranged coaxially with the coil springs and contacted with each other,



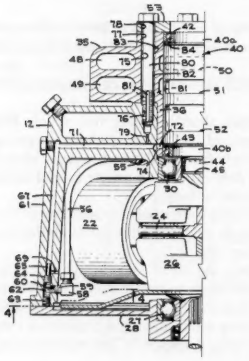
the first ring being able to be resiliently expanded in a radial direction when being pressed by the second ring.

3,869,962

AIR MOTOR

George E. Austin, Mercer Island, and Jagdish C. Kalyan, Seattle, both of Wash., assignors to Compressed Air Products Inc., Des Moines, Wash.

Filed Oct. 16, 1972, Ser. No. 298,124
Int. Cl. F01b *31/10*
U.S. Cl. 91—46 **4 Claims**



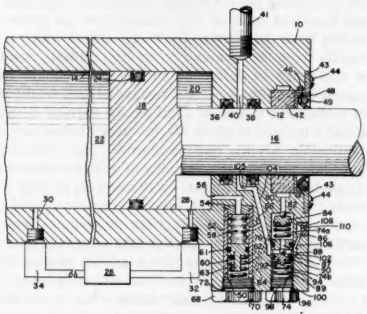
1. An air motor comprising a housing, a crankshaft in said housing, a plurality of power cylinders for effecting turning of said crankshaft, at least one bearing in said housing, means defining air passages for delivering pressurized air to said cylinders, and lubricating means responsive to the pressure of air in one of said air delivery passages for directing oil through said system to said bearing, said lubricating means comprising lubrication passages formed in said housing leading to said bearing, means defining a lubricating oil reservoir in the lower portion near the lower end thereof having a connecting passage communicating said reservoir with the lower section of said lubrication passages, a conduit communicating said one air delivery passage with said lubrication passage section and including a venturi nozzle in said lower lubrication passage section, the discharge end of said nozzle being slightly above the level of said connecting passage, whereby pressurized air discharged from said nozzle will draw oil through said connecting passage and entrain it for delivery to said bearing.

3,869,963

HYDRAULIC ACTUATOR HAVING A SELF-ASPIRATING ACTUATOR ROD SEAL

Arnold Schindel, Fairlawn, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 9, 1973, Ser. No. 407,351
Int. Cl. F01b *31/00*
U.S. Cl. 92—86 **5 Claims**



1. A hydraulic actuator assembly comprising:
a. a housing defining an operating chamber;
b. an actuator rod consisting of a piston portion disposed in said operating chamber and a stem portion connected to said piston portion and disposed in a bore formed in said housing;
c. means to introduce fluid into said operating chamber in a manner to reciprocate said rod relative to said housing;
d. absorbent material means located at the interface between said stem portion and the wall of said housing defining said bore for absorbing fluid leaking from said operating chamber;
e. a storage chamber in said housing;
f. means responsive to fluid pressure conditions in said operataing chamber for directing fluid from said absorbent means to said storage chamber when said rod moves in one direction, and for directing said fluid from said storage chamber externally of said housing when said rod moves in a direction opposite to said one direction;
g. sealing means for said fluid supported by said housing and extending between said operating chamber and said absorbent material means, comprising a pair of spaced sealing members and a passage extending between said sealing members, said passage being exposed at one end to the fluid leaking past said sealing member closest to said operating chamber and being connected at its other end to an outlet for directing said latter fluid externally of said housing.

4. A hydraulic actuator assembly comprising:
a. a housing defining an operating chamber;
b. an actuator rod consisting of a piston portion disposed in said operating chamber and a stem portion connected to said piston portion and disposed in a bore formed in said housing;
c. means to introduce fluid into said operating chamber in a manner to reciprocate said rod relative to said housing;
d. absorbent material means supported by said housing for absorbing fluid leaking from said operating chamber;
e. means for drawing fluid from said absorbent means and for discharging said fluid externally of said housing in response to fluid pressure conditions in said operating chamber when the said rod is moved comprising:
1. a storage chamber;
2. means dividing said storage chamber into first and second chambers;

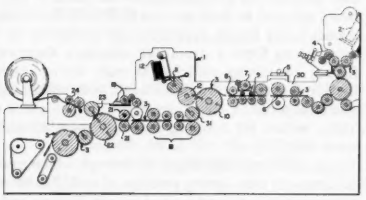
3. a first channel connecting said absorbent means to the first chamber of said storage chamber;
4. a second channel connecting the second chamber of said storage chamber externally of said housing;
5. a first spring loaded ball check valve closing off the point of entry of said first channel to said first chamber;
6. a third channel through said means dividing said storage chamber into first and second chambers;
7. a spring biased piston in said second chamber;
8. a second ball check valve closing off said third channel at its entry into said second chamber under the force of said piston;
9. means in said housing in response to fluid pressure conditions in said operating chamber for creating a vacuum when said rod is moved in one direction and a pressure in response to pressure conditions in said operating chamber when said rod is moved in the other direction;
10. a fourth channel coupling said vacuum means to said first chamber whereby said means creating a vacuum will open said first ball check valve drawing fluid from said absorbent means into said first chamber while at the same time closing off said second check valve and pressure in said fourth channel into said first chamber will cause the fluid therein to open said second check valve causing said fluid to flow into said second chamber and out said second channel externally of said housing.

3,869,964

METHOD AND APPARATUS FOR PRODUCING ARTICLES HAVING A POCKET CONTAINING A REMOVABLE INSERT

Richard Kranz, Shawnee Mission, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Aug. 20, 1973, Ser. No. 389,447
Int. Cl. B31b *1/82, 39/74*
U.S. Cl. 93—61 A **11 Claims**



1. A method of producing articles having a surface supporting sheet means forming a pocket containing a removable insert comprising:

a. propelling said articles along a path with said surface exposed;

b. applying said removable insert from a remote location into overlying, contacting, impermanent relation with said surface, said removable insert being of smaller size than said surface whereby said surface is partially covered by said removable insert and exposed over an area located beyond a substantial peripheral portion of said removable insert; and

c. applying said sheet means from a remote location into at least partially overlapping relation with said removable insert and into adhesive contact with said area forming a pocket at least partially containing said insert and having an opening sufficient to withdraw said removable insert therefrom,

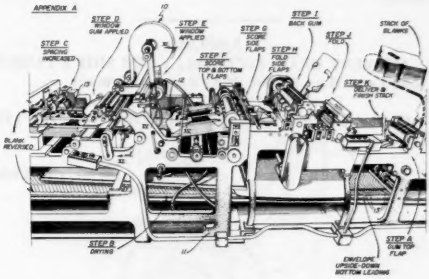
d. the application of said removable insert and sheet means being performed while continuously propelling said articles along said path.

3,869,965

ENVELOPE MACHINE

George F. Howatt, Holden, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.

Continuation of Ser. No. 335,725, Feb. 26, 1973, abandoned. This application July 12, 1974, Ser. No. 487,906
Int. Cl. B31b *1/82*
U.S. Cl. 93—61 A **6 Claims**


APPENDIX A
STEP D WINDOW GUM APPLIED
STEP E WINDOW APPLIED
STEP C SPACING INCREASED
STEP F SCORE TOP & BOTTOM FLAPS
STEP G SCORE SIDE FLAPS
STEP H FOLD SIDE FLAPS
STEP I BACK GUM
STEP J FOLD
STACK OF BLANKS
STEP K SEAL & FINISH STACK
BLANK REVERSED
STEP B DRYING
STEP A GUM TOP FLAP
ENVELOPE UPSIDE-DOWN BOTTOM LEADING

1. An envelope machine, comprising:

a. a frame,

b. a conveyor for carrying envelope blanks longitudinally of the frame,

c. a primary shaft rotatably mounted in and extending transversely of the frame above the conveyor and driven in synchronization therewith,

d. a secondary shaft rotatably mounted on the primary shaft with its axis parallel to and spaced from that of the primary shaft,

e. a gum applicator fastened to the secondary shaft and taking part not only in its rotation with the primary shaft, but also in its rotation about its own axis,

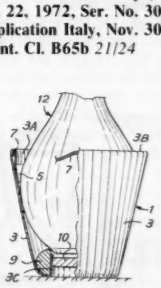
f. means producing the said rotation of the secondary shaft to move the applicator from an operative position wherein rotation of the primary shaft causes the applicator to engage an envelope blank on the conveyor to an inoperative position wherein the applicator does not strike the conveyor, the said means consisting of an actuator, a flexible transmission means arranged in a line operated on one end by the actuator, and an abutment on the secondary shaft engaged by the other end of the line.

3,869,966

METHOD FOR FORMING A SHAPED COVER FOR A FLASK

Carlo Brandigi, Tosi Reggello, and Giuliano Fantechi, S. Ellero, Reggello, both of Florence, Italy (I-50060)

Filed Nov. 22, 1972, Ser. No. 308,722
Claims priority, application Italy, Nov. 30, 1971, 9769/71
Int. Cl. B65b *21/24*
U.S. Cl. 93—54 R **3 Claims**



1. A process for forming a cover for a flask comprising the steps of first covering an inverted flask laterally with a skirt by arranging a plurality of parallel, evenly distributed, lengths of strip-like material in an open-ended annular configuration around the inverted flask; then placing an annular core within the skirt adjacent one end thereof; thereafter deforming the

corresponding end portions of the lengths of strip-like material, adjacent said one end, relative to the annular core, so that such corresponding end portions lie adjacent the interior of the annular core; and finally anchoring the corresponding end portions by inserting plug means into the annular core so that the corresponding end portions of the lengths of strip-like material are clamped between the inner surface of the annular core and the plug means, with the core providing a base of the cover.

3,869,967

AIR VENT HEAD, ESPECIALLY FOR SHIP'S TANKS

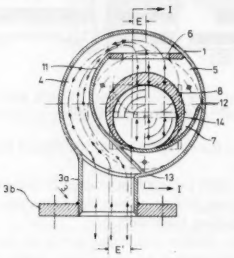
Josef Lenz, Haus No. 40, 2831 Russen, Germany

Filed Nov. 15, 1973, Ser. No. 416,044

Claims priority, application Germany, Nov. 16, 1972, 2256144

Int. Cl. F23l *17/02*

U.S. Cl. 98—61 **10 Claims**



1. A cylindrical air vent head for ventilation of ship's tanks including,

means defining a first chamber having a circumferential wall,

a connecting piece attached to said circumferential wall for a vent pipe,

means defining a second chamber connected to the outside of the cylindrical head and connected to the first chamber by a communicating orifice in a common wall of both chambers,

said second chamber being arranged eccentrically within the first chamber,

and means responsive to water entering said second chamber for closing said communicating orifice.

3,869,968

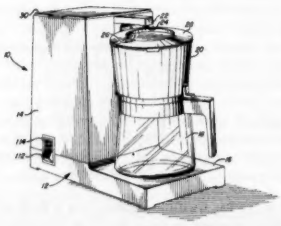
COFFEE MAKER

Russell E. Ihlenfeld, Allentown, Wis., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Sept. 24, 1973, Ser. No. 400,197

Int. Cl. A47j *31/56*

U.S. Cl. 99—280 **8 Claims**



4. In a coffee maker; a water boiler housing having an electrical boiler heater; a thermostatic switch coupled to said boiler heater for electrically energizing and de-energizing it; said thermostatic switch disposed to sense the temperature of said boiler for controlling said heater; a coffee pot heater; and thermally conductive means disposed and adapted to transfer heat from said coffee pot heater to said boiler to thereby hold said thermostatic switch at a temperature to maintain said boiler heater de-energized after water flow through said boiler has been reduced and depleted and after said thermostatic switch has initially responded to an increase in boiler temperature which has thereby de-energized said boiler heater.

3,869,969

TOASTING APPARATUS

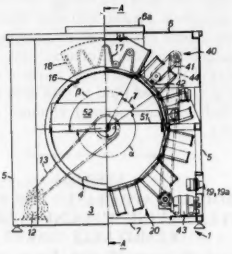
Douglas Cecil William Thomas Sharp, Midgham, England, assignor to Watermill Engineering Limited, Woolhampton, England

Filed June 25, 1973, Ser. No. 373,002

Claims priority, application Great Britain, July 3, 1972, 30946/72

Int. Cl. A47j *37/04*

U.S. Cl. 99—327 **26 Claims**



1. A toasting apparatus, comprising

a. a disc member mounted for rotation about a fixed axis;

b. a plurality of frames circumferentially mounted on said disc member for rotation therewith, each of said frames being adapted to hold an item of food to be toasted, said frames being fixedly secured to the periphery of the disc member to form a drum-like structure therewith, said frames containing radially inwardly facing openings to permit items of food to be loaded from within the drum-like structure;

c. drive means for rotating said disc member about said fixed axis;

d. means defining a heating zone through which said frames successively pass during rotation of said disc member for toasting items of food loaded in said frames; and

e. means defining an unloading station through which said frames successively pass following the passage thereof through said heating zone, thereby permitting removal of the items of food after toasting.

3,869,970

ELECTRIC TOASTERS

John Scott Eagle, Stamford, England, assignor to British Domestic Appliances Limited, Peterborough, England

Filed Nov. 29, 1972, Ser. No. 310,410

Claims priority, application Great Britain, Nov. 30, 1971, 55509/71

Int. Cl. A47j *37/08*

U.S. Cl. 99—329 R **11 Claims**

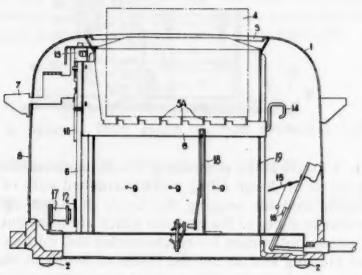
1. An electric toaster comprising;

a. electric heating means;

b. means for supporting a slice of bread for movement from an original position out of proximity with the electric heating means to a toasting position adjacent the electric heating means, said supporting means having portions which engage the bread and spaces between said portions;

c. stop means having portions positioned to engage the bread and bring it to rest in the toasting position, which portions are spaced apart to permit said portions of the support means to pass between them for further movement after the bread has been brought to rest and is supported in the toasting position by the stop means;

d. switch contacts operable by said further movement of the portions of the support means beyond the position at which the bread is brought to rest and effective to complete an energizing circuit for the electric heating means; and



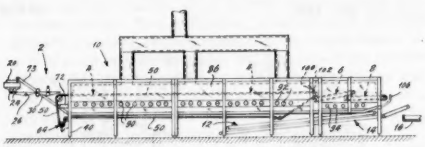
e. means adapted to return the support means automatically towards the original position in which the bread is out of proximity with the electric heating means when the bread has been toasted to a predetermined degree, and thereby cause the switch contacts to disconnect the energizing circuit for the electric heating means before the portions of the support means engage the bread to move it away from the stop means.

3,869,971

APPARATUS FOR PREPARING FOLDED FOOD CHIPS

Robert R. Driscoll, Buena Park, Calif., assignor to Pet Incorporated, St. Louis, Mo.

Filed May 10, 1972, Ser. No. 252,007
Int. Cl. A47j *37/12*
U.S. Cl. 99—353 **17 Claims**



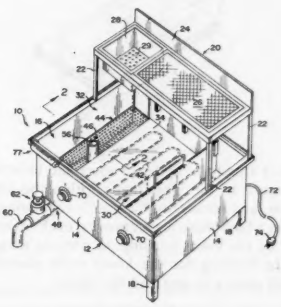
1. An apparatus for preparing folded food chips from dough, said apparatus comprising: means for forming the dough into disk-shaped segments, an endless shaping conveyor having a conveying pass which is narrower than the disk-shaped segments and on which the disk-shaped segments are deposited and supported with the conveying pass generally bisecting the segments, whereby the sides of the disk-shaped segments drape downwardly and the segments assume a folded configuration; means disposed beneath the conveying pass of the shaping conveyor for preventing the sides of the folded segments from curling under the conveying pass; and means for heating the folded segments when they are on the shaping conveyor to remove moisture therefrom.

3,869,972

FRYER

Bert Chase, Tampa, Fla., assignor to Virginia Chase; Dorothy Miller and Ruby Paxton, all of Tampa, Fla., part interest to each

Filed Nov. 5, 1973, Ser. No. 412,980
Int. Cl. A47j *37/12*
U.S. Cl. 99—410 **9 Claims**



1. A cooking apparatus primarily designed for cooking food products in shortening material, said apparatus comprising: a housing, cooking tank means mounted on said housing and configured to contain shortening therein, said tank means comprising a plurality of heating zones, including at least a first and second zone disposed in communicating relation with one another, both said first and second zones mounted within said tank means in substantially adjacent relation to one another and each comprising base means, said base means of said first and second zone disposed in substantially stepped relation to one another, wherein said base means of said second zone is disposed lower than said base means of said first zone, heating means disposed in substantially contiguous relation to said base means of said first zone and out of direct fluid contact with the interior of said tank means, said heating means further disposed in substantially spaced relation to said second zone, whereby the temperature in said first zone is maintained at a substantially higher temperature than in said second zone; shortening removal means mounted on said base of said second zone in fluid communication with said fluid tank means, flow regulating means removably attachable to said shortening removal means and configured to regulate the flow of shortening from said tank, seal means removably attached in sealing engagement with said shortening removal means, said flow regulating means comprising a stand pipe including an elongated conduit having oppositely disposed open ends, one of said ends removably engaging said shortening removal means and the opposite end oriented in spaced relation thereto adjacent the surface of the shortening in said tank means, said seal means disposed in non-sealing engagement with said removal means when said stand pipe is connected thereto, whereby the removal of shortening adjacent said base of said second zone is prevented.

3,869,973

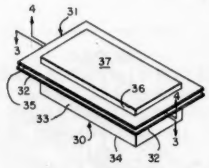
GRILL FOR MAKING SEALED TOASTED SANDWICHES

Myron A. Quitman, 1459 Hewlett Ave., Hewlett, N.Y. 11557

Filed Feb. 7, 1973, Ser. No. 330,444
Int. Cl. A47j *37/01, 43/20*
U.S. Cl. 99—426 **3 Claims**

1. In a grill for making sealed toasted sandwiches, a lower mold plate, an upper cooperating mold plate, both of the mold plates having flat marginal rims, a mount supporting the lower mold plate, a mount supporting the upper mold plate, a sleeve snugly engaging the edge of the lower mold plate, a lower housing section supporting the sleeve and the lower plate's

mount, an upper housing section supporting the upper plate's mount, the housing sections telescoping in snug relationship and completely enclosing the mold plates, their mounts and the sleeve, the upper plate, followed by its mount and snugly engaged with the sleeve, simultaneously telescoping within the sleeve to a final position in which the flat marginal rims of the



plates are at a uniform distance apart and in which the plates apply pressure to the ingredients within the sleeve and between them, and means for accurately regulating this uniform distance, in which there are networks, each attached to either the upper or the lower housing, to provide means of attachment to the housing for the lower mold plate's mount, the upper mold plate's mount and the sleeve.

3,869,974

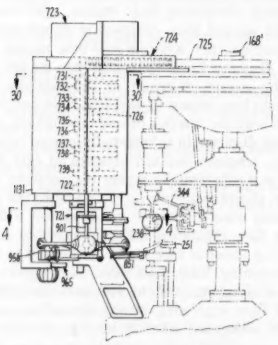
MACHINE FOR SEED CELLING APPLES

Robert G. Ellis, Richmond, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed Apr. 26, 1972, Ser. No. 247,838

Int. Cl. A23n *3/12*

U.S. Cl. 99—547 **10 Claims**



1. In a continuous apple peeling, coring and seed celling machine wherein the apple is impaled on the upper end of a cylindrical core tube which tube has cut a cylindrical core hole in the apple; means for withdrawing the core tube from the apple; means for engaging the core hole in the apple to guide the apple by the core hole as the core tube is withdrawn from the apple; means for moving the engaging means to a first station; an indexing turret rotatably movable over a path including said first station, a seed celling station and a discharge station; at least one pair of copperatively disposed jaws mounted on the turret for movement therewith; means for moving the jaws to engage and resiliently grasp an apple at the first station without regard to the size and shape of the apple and without disturbing the predetermined position of the engaging means; means for moving the engaging means out of the core hole when the jaws are in engagement with the apple; and means connected with the turret to rotate the turret and thus said jaws and an apple grasped thereby to said seed celling station.

3,869,975

PASTRY CUTTER

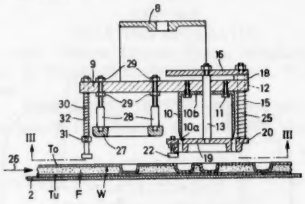
Ruedi Seewer, Burgdorf, Switzerland, assignor to Seewer AG, Maschinenfabrik, Burgdorf, Switzerland

Filed Apr. 9, 1973, Ser. No. 349,283

Claims priority, application Germany, Apr. 20, 1972, 7215054

Int. Cl. A21c *11/10*

U.S. Cl. 99—450.2 **5 Claims**



1. A pastry cutter comprising conveying means for advancing layers of dough along a predetermined path of travel, a pressing tool for pressing the layers of dough against one another in zones of the material which are to be cut through, a cutting tool, means for synchronizing said cutting tool with said pressing tool to cut the layers of dough at the pressed regions, said synchronizing means comprising a carrier plate at the underside of which are secured the pressing tool and the cutting tool in a position above said conveying means, means mounting the carrier plate for movement up and down, said pressing and cutting tools being axially spaced from one another at said carrier plate in the direction of travel of the conveyor means.

3,869,976

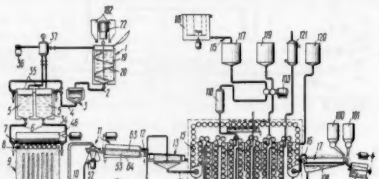
INSTALLATION FOR THE PRODUCTION OF GRANULATED PRODUCTS

Alexandr Nikolaevich Nesmeyanov, Leninskie Gory, MGU, korpus K, kv. 105; Sergei Vasilievich Rogozhin, ulitsa Vavilove, 55/5, kv. 20; Vladimir Ivanovich Misjurev, Nagatinskaya naberezhnaya, 28, kv. 198, all of Moscow; Alexei Gennadievich Borisoglebsky, ulitsa Sverdlova, 36/1, Kaliningrad Moskovskoi oblasti; Jury Feodosievich Yaroshenko, Novo-Basmannaya ulitsa, 17a, kv. 103, Moscow; Rodriges Sesar Gonsales, 9 Parkovaya ulitsa, 57, Korpus 3, kv. 18, Moscow; Petr Vasilievich Kovalev, Varshavskoe shosse, 98, kv. 45, Moscow, and Valery Alexandrovich Myakin, Krymsky val, 8, kv. 26, Moscow, all of U.S.S.R.

Filed June 20, 1973, Ser. No. 371,698

Int. Cl. A23p *1/00*

U.S. Cl. 99—484 **10 Claims**



1. An installation for the production of granulated products from food substances comprising in combination:

a means for preparing a food substance in liquid form;

means for controlling the feed of the food substance in liquid form connected in series with said means for preparing the food substance in liquid form;

a means for forming granules of the food substance in liquid form in a forming liquid connected in series with said means for controlling the feed of the food substance in liquid form;

a means for separating said granules from said forming liquid;

a means for sorting said granules according to size connected in series with said means for separating said granules from said forming liquid;

means for continuously treating said granules with water solutions connected in series with said means for sorting the granules according to size; and

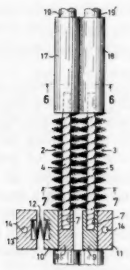
a means for mixing said granules with taste and aroma substances connected in series with said means for continuously treating the granules with water solutions.

3,869,977

HULLER FOR BERRIES

Salvador A. Minera, 1500 Judah St., San Francisco, Calif. 94122

Filed June 20, 1973, Ser. No. 371,829
Int. Cl. A23n *15/02*
U.S. Cl. 99—640 **9 Claims**



9. A huller for a strawberry having a central axis and a calyx with a stem enlargement on said axis at one end of said strawberry, which calyx includes a row of sepals integral with said stem-enlargement extending radially from said axis over said one end, comprising:

a. a pair of rotary brushes of substantially the same diameter supported for rotation about central axes in spaced side-by-side relation having flexible, relatively stiff, resilient bristles extending radially outwardly from and around its axis of rotation with the outer end portions of the bristles of said pair in lapping relation at the adjacent sides of said pair for flexing under the influence of the sepals of a strawberry being drawn between said brushes during rotation of the latter in opposite directions;

b. said brushes being elongated axially, and means connected with said brushes for rotating them simultaneously in opposite directions about their axes whereby said bristles will move from one of their sides toward each other and then in the same direction at their adjacent sides in lapping relation away from said one of their sides;

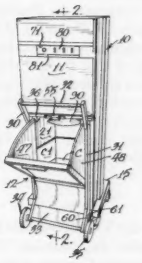
c. the maximum diameter of each of said brushes being small relative to the thickness of the berry to be hulled in a direction across the calyx, whereby such calyx on a strawberry engaging said brushes at said one of the sides of said pair will be quickly drawn between the lapping portions of the bristles for drawing said calyx from such strawberry and for drawing said stem-enlargement from said strawberry together with said calyx during said rotation of said brushes.

3,869,978

WASTE COMPACTOR

Richard W. Steinberg; Samuel B. McClocklin, and Clarence L. Kostelecky, all of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed May 9, 1973, Ser. No. 359,198
Int. Cl. B30b *15/30, 15/06*
U.S. Cl. 100—53 **7 Claims**



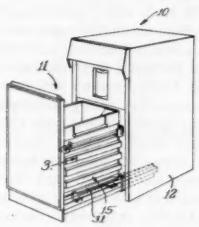
1. A compactor including a separable wheeled cart, a casing with a front wall having an opening to receive said cart, means to removably lock said cart to said casing, said cart having a front wall which closes off said opening when the cart is in locked position, means on said cart to hold a container for receiving material to be compacted, said cart front wall being defined at least in part by a loading chute mounted for pivotal movement relative to the remainder of the cart, and compacting means within the casing including a smooth surfaced downwardly concave disc and means including a fluid motor for lowering said disc against material in the container to exert forces acting downwardly and inwardly on all of said material immediately beneath said disc.

3,869,979

REFUSE COMPACTOR RECEPTACLE

Charles E. Sulcek, Danville, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 28, 1973, Ser. No. 419,763
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **18 Claims**



1. A refuse compactor receptacle structure adapted to support a refuse holding bag in a refuse receiving arrangement, have deposited refuse compacted therein, and be manually rearranged to permit facilitated removal of the bagged, compacted refuse therefrom, said receptacle structure comprising:

first wall means defining an enclosure having an open side;

second wall means defining a closure for said open side and individually projecting portions including a bottom wall and partial side walls nested with said first wall means for partially enclosing the bag;

freely separable pivot means pivotally connecting said second wall means to said first wall means for pivoting of the second wall means outwardly from the nested arrangement;

limiting means for selectively limiting the pivoting of said second wall means outwardly to an access position wherein the bagged refuse is freed from said first wall means and is readily accessible for separation from said second wall means; and

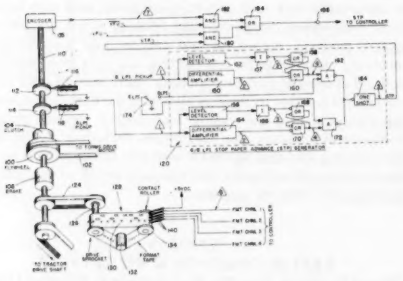
retaining means arranged to maintain the pivotal connection of the second wall means to said first wall means in the nested arrangement and access position while permitting separation of said second wall means from said first wall means as an incident of release of said limiting means and further pivoting of the second wall means to a separation position beyond said access position and raising of the second wall means from said separation position upwardly relative to said first wall means.

3,869,980

HIGH SPEED DATA PROCESSOR LINE PRINTER

Marvin C. Schroeder, Jr., Mission Viejo, Calif., assignor to Cordura Corporation, Century City, Calif.

Filed Aug. 10, 1973, Ser. No. 387,364
Int. Cl. B41j *1/08*
U.S. Cl. 101—93.21 **3 Claims**



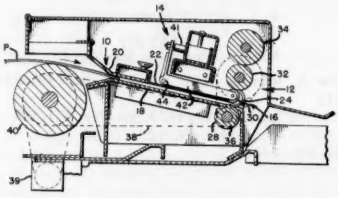
1. In a high speed line printer system which includes a frame; a print drum rotatably mounted on said frame and having a plurality of different bar code symbols engraved on the peripheral surface thereof in a plurality of different longitudinal rows angularly spaced around the periphery from one another, and with each row containing identical bar code symbols; a paper drive mechanism mounted on said frame for moving forms on a line-to-line basis past said print drum to be imprinted by said bar code symbols; impact hammer means mounted on said frame; control circuitry coupled to said impact hammer means for causing said impact hammer means to drive said forms against the bar code symbols on said print drum at controlled times; electrical signal generating means coupled to said paper advance mechanism for producing electric pulses representative of each line advance of said paper drive mechanism with respect to a first predetermined line per inch reference standard; a format control system mechanically coupled to said paper drive mechanism and to said generating means for generating electrical control signals indicative of advances of said forms by said paper drive mechanism through predetermined numbers of lines; the combination of an encoder mechanically coupled to said paper advance mechanism for generating an electric signal representative of each line of advance of said paper drive mechanism with respect to a second predetermined line per inch reference standard; logic circuitry electrically connected to said format control system and to said encoder for generating electric output signals selectively representative of the electrical control signals from said format control system and of said electric signal from said encoder; and control means coupled to said paper drive system and responsive to the output signals from said logic circuitry to stop the paper drive system at predetermined positions of the forms under the control of the format control system during one operating mode and under the control of the encoder during a second operating mode.

3,869,981

HIGH SPEED MARKING DEVICE

Ernest D. Davis, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Jan. 18, 1973, Ser. No. 324,655
Int. Cl. B41b *25/00*
U.S. Cl. 101—91 **3 Claims**



1. A high speed printing device for placing indicia on rapidly moving, flat, flexible, lightweight sheets comprising:

means for guiding a rapidly moving sheet along a predetermined path,

a plurality of spaced printing means in said path movable into contact with the sheets for placing indicia marks on successive sheets without impeding the progress of the sheets as the sheets move along said path, said printing means including a plurality of printing rollers having indicia on their outer surfaces, an inking roller, and a transfer roller for transferring a marking medium to said printing rollers from said inking roller and for rotationally propelling the printing rollers when in engagement therewith to a peripheral speed approximately equal to the linear speed of the paper, and

control means for selectively energizing said printing means for contacting the sheets and placing the indicia on said sheets in various coded patterns, said control means including delay means for varying the moment of initial energization of the printing means to place the marks at a predetermined position on the sheet, dwell means for varying the length of time the printing means is in contact with the sheets to determine the length of the indicia marks on the sheets, and actuating means for selectively moving one or more of said printing rollers into engagement with said sheets and out of engagement with said transfer roller into a non-driven, freely rotatably printing position so as not to skew the sheets.

3,869,982

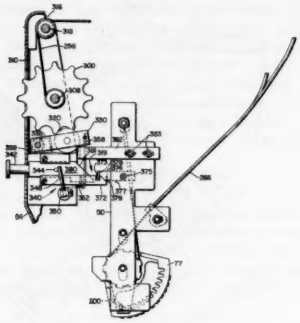
WEIGHING AND PRINTING APPARATUS

Austin L. Davis, Brandon, and Harley R. Davidson, Rutland, both of Vt., assignors to Howe Richardson Scale Company, Clifton, N.J.

Filed Nov. 27, 1972, Ser. No. 309,879
Int. Cl. B41j *1/60, 3/44;* **G01g** *23/18*
U.S. Cl. 101—96 **13 Claims**

1. In a printer, a plurality of rotatably mounted printing type carriers, a casing structure receiving said carriers and having an access opening, a cover for selectively closing said opening and being mounted for displacement between closed and opened positions, a plurality of selectively displaceable selector elements carried by said cover for selecting the printing positions of said carriers, motion transmitting means connecting each selector element to one of said carriers for imparting selective displacement of the former to the latter, reset means

operatively connected to said selector elements and being selectively operable to reset said selector elements to pre-



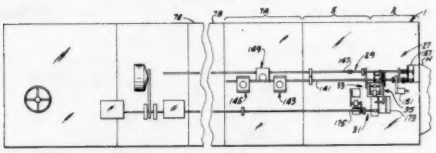
selected positions, and means locking said cover in its closed position until said reset means is selectively operated to reset said selector elements to said pre-selected positions.

3,869,983

VARIABLE REPEAT-LENGTH WEB PRINTING PRESS

John R. Garber, P.O. Box 254, Ashland, Ohio 44805, and John L. Garber, 720 Coulter, Kirkwood, Mo. 63122

Filed Aug. 27, 1973, Ser. No. 392,017
Int. Cl. B41f *7/04, 13/02, 13/54*
U.S. Cl. 101—137 **49 Claims**



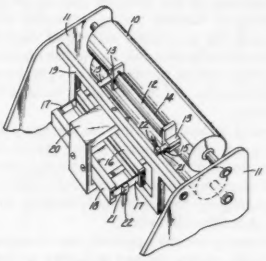
1. A web printing press having means for controlling movement of web stock along a path and at least one printing station for printing an image on said web stock as it moves along said path, said printing station comprising a plurality of rolls for printing said image on said web stock including an ink image carrying roll and an impression roll paired with said image roll, said web stock passing between said image and impression rolls for having an image imprinted thereon, means for moving said impression roll toward and away from said image roll between a printing position in which the impression roll is in printing contact with the web stock between the image roll and the impression roll and a retracted position, and means for applying ink to said image roll, a drive for said press including a first means for driving said image roll and said inking means and a second means for driving said web control means, and coupling means engageable and disengageable for coupling and uncoupling said second drive means relative to said first drive means, said coupling means including means for bringing said second drive means up to the speed of and into phase with said first drive means and to positively lock said first drive means and said second drive means together when these drive means are in phase with one another, whereby said second drive means may be uncoupled from said first drive means and said impression roll moved out of printing contact with said web stock so that said inking means and said image roll may be operated independently of feeding web stock through the printing station.

3,869,984

FLUID FILM THICKNESS SENSOR AND CONTROL SYSTEM FOR UTILIZING SAME

Thomas Daniel Toth, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 6, 1973, Ser. No. 386,000
Int. Cl. G01n *33/26*
U.S. Cl. 101—349 **21 Claims**



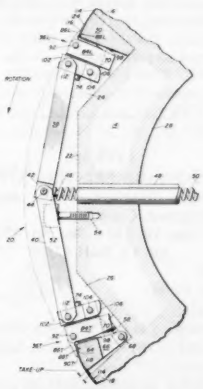
1. A process for determining the thickness of a fluid film which comprises generating signals representative of two shear responsive forces acting upon said fluid film, one of said shear responsive forces being directly proportional to the thickness of said fluid film and the other of said shear responsive forces being inversely proportional to the thickness of said fluid film, and combining said signals to obtain a resultant signal which is representative of the thickness of said fluid film and independent of other variables which affect said two shear responsive forces.

3,869,985

CLAMPING AND TENSIONING A SHEET ON A CYLINDER

Floyd Steinmetz, Timonium, and William F. Thoms, Baltimore, both of Md., assignors to The Rotographic Machinery Company, Cockeysville, Md.

Continuation of Ser. No. 9,343, Feb. 6, 1970, abandoned. This application Dec. 18, 1973, Ser. No. 425,910
Int. Cl. B41f *27/06, 7/22*
U.S. Cl. 101—415.1 **16 Claims**



1. In a rotating cylinder impression machine, a device for clamping and tensioning the ends of a die sheet on a cylinder, comprising in combination with a cylinder having a leading edge relative to its rotational direction and defining the position to be occupied by the first end of said die sheet and a trailing edge defining the position to be occupied by the opposite end of said die sheet, said cylinder having a leading edge cutout portion, a trailing edge cutout portion, and a flat cutout

portion positioned between said leading and trailing edge cutout portions, all the said cutout portions extending substantially axially across the cylinder, the clamping and tensioning device bridging said flat cutout portion and lying below the periphery of the cylinder between the positions occupied by the ends of the die sheet and within the space defined by the cutout portions and further being secured to the cylinder, the clamping and tensioning device further comprising:

a stationary clamping bar disposed within the leading edge cutout portion of the cylinder and secured thereto, the bar having a radially facing clamping surface fitting flushly with the perimetric surface of the cylinder;

at least one pivotally movable clamp bar disposed within the trailing edge cutout portion of the cylinder and pivotally attached thereto, the bar having a radially facing clamping surface;

first clamping means opposing the clamping surface of the clamping bar and including spring means held between the clamping bar and said first clamping means and biasing said clamping means toward the clamping surface of the clamping bar for tensionably holding the first end of the die sheet therebetween;

second clamping means opposing the clamping surface of the movable clamp bar and including spring means held between the movalbe clamp bar and said second clamping means and biasing said clamping means toward the clamping surface of the clamping bar for tensionably holding the second end of the die sheet therebetween;

first link means pivotally connected to the first clamping means and extending transversely of the cylinder toward the second clamping means;

second link means pivotally connected to the second clamping means and extending transversely of the cylinder toward the first clamping means and connecting pivotally with the first link means medially of the flat cutout portion of the cylinder;

hinge means hingeably connecting the first and second link means at their respective inner ends for articulating the said link means relative to each other to allow the pivotally joined inner ends of the link means to be movable outwardly from the cylinder in a radial direction; and,

coil spring means housed within the cylinder and extending radially from therewithin to abut and act against the first and second link means at substantially the hinged juncture thereof, the coil spring means biasing the hinged ends of the said link means outwardly from the cylinder in a radial direction, thereby to bias the first and second clamping means toward each other in substantially a circumferential direction to tension the die sheet on the cylinder.

3,869,986

INK JET POSTAGE PRINTING APPARATUS

David W. Hubbard, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 16, 1974, Ser. No. 433,805
Int. Cl. B41l *47/50*
U.S. Cl. 101—91 **8 Claims**

7. In a postage meter:

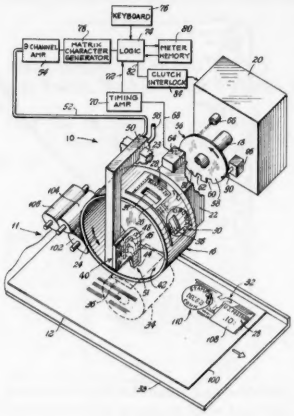
a printing station;

means for supporting at said station a document such as an envelope, label or the like that is to have postage indicia printed thereon;

an ink jet printing device adapted to project a predetermined sequence of ink droplets onto said document for printing the postage amount portion of said postage indicia;

security means mounted in said meter for movement through the region between said document and said ink jet printing device;

said security means including a masking member movably mounted in said meter and when in a first operative position being adapted to permit said ink droplets to reach said document and when in a second operative position



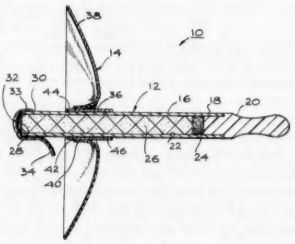
being adapted to block passage of any of said ink droplets to said document.

3,869,987

PYROTECHNIC DEVICE

Aldo S. Berchielli, Westerly, R.I., assignor to Yardney International Corp., Los Angeles, Calif.

Filed Nov. 28, 1973, Ser. No. 419,642
Int. Cl. C06d *1/10*
U.S. Cl. 102—37.4 **9 Claims**



1. An improved pyrotechnic device comprising, in combination:

a. a pyrotechnic torch comprising

1. an elongated open-ended hollow tube,
2. A handle disposed adjacent one end of said tube and in sealing engagement therewith,
3. Ignition means disposed in sealing engagement with the opposite end of said tube and in communication with the interior of said tube, and
4. An ignitable pyrotechnic substance disposed within said tube and in communication with said ignition means; and

b. A reflector assembly comprising

1. A support disposed adjacent said tube and in sliding engagement therewith for travel along the length of said tube, and
2. A readily bendable, focusable light reflector secured to said support for travel therewith along the length of said tube.

3,869,988
CONSOLIDATING BALLAST

Olaf Unbehaun, Neunkirchen; Uwe Hampel, Ludwigshafen; Norbert Scholz, Mannheim; Horst Gassmann, Viernheim; Walter Schneider, Ludwigshafen; Heinz Hesser, Hochdorf-Assenheim; Walter Herrmann, Mannheim, and Bertold Bechert, Nurnberg, all of Germany, assignors to BASF Aktiengesellschaft Ludwigshafen/Rhein and Heinrich Cronan, Building Contractors, Land Saarlund, both of Germany

Filed May 24, 1974, Ser. No. 472,454

Claims priority, application Germany, May 26, 1973, 2327063

Int. Cl. E01h *11/00*

U.S. Cl. 104—11 **7 Claims**

1. A process for consolidating ballast in railroad track, wherein the ballast is tamped and rammed by mechanical means and, during the tamping and ramming operations, a binder for the ballast is sprayed into said ballast in liquid form in the zones of operation of said mechanical means.

3,869,989
CONVEYOR

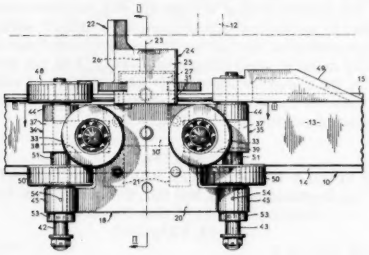
William Frank Pickstone, Halesowen, England, assignor to Redman Fisher Engineering Limited, Tipton, Stafford, England

Filed Dec. 28, 1973, Ser. No. 429,639

Claims priority, application Great Britain, Mar. 30, 1973, 15537/73

Int. Cl. B61b *3/00*

U.S. Cl. 104—94 **4 Claims**



1. In a conveyor comprising a track having two channel section portions which extend side-by-side with their open mouths presented towards each other and a trolley having a body and a plurality of load bearing wheels which run inside the channel section portions of the track and support the body from the track, the improvement wherein:

the trolley comprises carrier means,

the load bearing wheels are mounted on the carrier means for rotation relative thereto about respective axes,

the body has a contact surface which faces outwardly from the body in a direction along the track and transverse to the axis of one of said load bearing wheels,

the carrier means engages with said contact surface of the body,

and releasable retaining means is provided for holding the carrier means in engagement with said surface of the body,

whereby, when the retaining means is released, the carrier means can be withdrawn from the body in a direction parallel to the length of the track.

3,869,990
SWITCH ARRANGEMENT FOR A MAGNETIC SUSPENSION RAILROAD

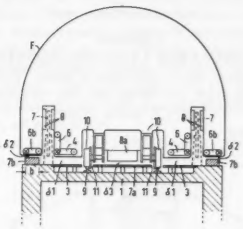
Anton Bertling, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 6, 1973, Ser. No. 394,862

Claims priority, application Germany, Sept. 29, 1972, 2247858

Int. Cl. E01b *25/26*

U.S. Cl. 104—130 **4 Claims**



1. In a magnetic suspension railroad wherein there is installed in the railroad vehicle at least one winding carrier of a linear motor and primary conductor means for magnetic support and lateral guidance of the vehicle which primary roadbed, means cooperate with secondary conductor means associated with the raodbed, with lateral guidance provided by secondary conductor plates installed vertically on each side of the roadbed, an improved switching arrangement for such a railroad comprising:

a. horizontal secondary conductor means replacing said vertical secondary conductor means in the area of the switch, only on the outsides of the track of the roadbed to result in the air gap between said secondary conductor means and primary conductor means in the vehicle lying in planes essentially parallel to the plane of the roadbed; and

b. additional primary conductor loops arranged in the vehicle to react with said secondary conductor loops whereby by selecting one or the other of the primary control loops in the vehicle, the direction of travel may be selected.

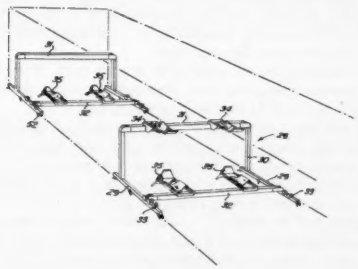
3,869,991
STOWAGE OF VEHICLES

Christopher Thomas Robinson, c/o Containerised Automobiles Limited, 140 Park Ln., London W1Y 4HT, England

Filed June 20, 1973, Ser. No. 371,705

Int. Cl. B65j *1/22*

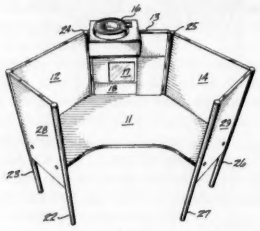
U.S. Cl. 105—368 R **3 Claims**



1. A frame for supporting a vehicle at an angle inclined to the horizontal, the frame comprising a pair of spaced foot members, a holding leg extending perpendicularly from each

foot member, a beam adapted to be releasably attached at each of its ends to the free end of a holding leg, at least two vehicle wheel cradles attached to the said beam at spaced locations thereon, each cradle extending from said beam, and flexible belt means attached to each of said cradles on which a vehicle wheel can be held with its axis parallel to the longitudinal axis of said beam, each of said wheel cradles being adapted to cooperate with a jack whereby a vehicle wheel can be supported on said jack and does not come into contact with its wheel cradle until lifting of said jack commences.

3,869,992
CLUSTERABLE LEARNING MODULE
Edward J. Kramer, Rt. 1, Box 846, Clinton, Wash. 98236
Filed Sept. 11, 1972, Ser. No. 287,842
Int. Cl. A47b *57/00*
U.S. Cl. 108—60 **8 Claims**



1. An educational module, comprising:

a generally horizontal writing panel of generally arcuate configuration in plan having a concavely configured edge presented adjacent a seated user, a convexly configured edge opposite from the user, and end edges joining said convexly and concavely configured edges and converging toward each other in the direction of the seated user, said convexly configured opposite edge comprising an intermediate edge portion directly opposite said seated user, and respective connecting edge portions between respective adjacent end edges and said intermediate edge portion, thereby defining six corners;

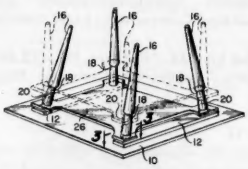
upright support leg members positioned at each of said six corners;

five upright panels successively connected to and extending between the successive leg members, two of said upright panels being rigidly secured to the leg members and extending adjacent said end edges, said rigidly secured upright panels and their associated leg menbers forming first and second panel combinations respectively the remaining panels extending adjacent said connecting edge portions and said intermediate edge portion and being removably secured to and extending between associated support leg members;

first bracket means secured to at least each of the two leg members adjacent said intermediate edge portion and also secured to said writing panel; and,

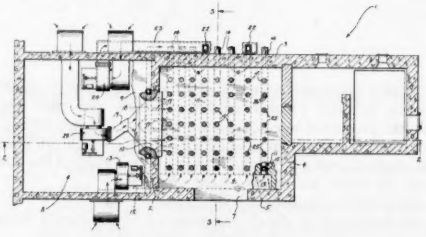
second bracket means secured to each of said first and second panel combinations, and also secured to said writing panel, said first and second bracket means cooperating to maintain said leg members in an upright position and said writing panel in a generally horizontal position, and in relation to each other such that portions of said leg members and said upright panels extend substantially above said horizontal writing panel at least to approximate head level of the user sitting at said concave edge, and further cooperate to maintain said leg members and said writing panel in position when one or more of said removably secured panels are removed from the module.

3,869,993
SELF LOCKING SHELF TABLE
Walter W. Edlund, 1201 Spear St., South Burlington, Vt. 05401
Filed Apr. 18, 1973, Ser. No. 352,352
Int. Cl. A47b *57/00*
U.S. Cl. 108—101 **5 Claims**



1. In a knockdown table the combination of a table top and shelf, a plurality of cleat members secured to the bottom surface of said table top, said cleat members having recesses formed therein and closed by said top, said cleat members having threaded nut members positioned in said recesses, a plurality of leg members, each leg member having a reduced portion adjacent one end thereof, said end of each leg having a threaded member projecting outwardly therefrom, said shelf being of a size and shape complimentary to that of said table top, said shelf having an opening therein complimentary to each threaded nut member, the distance from the center of one opening in said shelf to the center of another opening in said shelf being less than the distance between the centers of the corresponding threaded nut members in said cleat members, each leg member having said end thereof project through an opening in said shelf with the threaded member thereof engaging a threaded nut member, said threaded member of each leg initially having a loose fit with said threaded nut member to facilitate the positioning of said shelf within the reduced portion of said leg member, said threaded member of each leg member upon being threaded into said nut member drawing the end of the leg member into engagement with said cleat member contemporaneous with anchoring said shelf on the reduced portion of said leg member.

3,869,994
AIR SUPPLY FOR PIT TYPE REFUSE INCINERATOR
Max Von Berlichingen, P.O. Box 901, Green Bay, Wis. 54301
Filed Dec. 10, 1973, Ser. No. 424,349
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **7 Claims**



1. In an incinerator of the class described having a floor and surrounding walls defining a substantially rectangular combustion chamber with a clean-out opening in one side wall extending to the floor of the chamber and a charging opening in a wall at right angles to said first wall and disposed near the top of the chamber, a plurality of horizontal air ducts extending in parallel beneath the floor of the combustion chamber, an air supply header connected to one end of each duct near said first wall of the combustion chamber, a plurality of vertically disposed ducts connected individually to the opposite end of

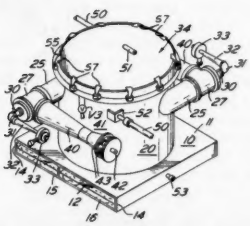
each of said first named ducts and extending upwardly along and on the outside of the corresponding wall opposite said first wall of the combustion chamber with the upper end of each duct closed, a plurality of underfire jet ports in the floor of the combustion chamber connected to each said horizontal duct to receive air therefrom, an overfire port leading through the last named wall of said combustion chamber from each of said vertical ducts, whereby said horizontal ducts constitute manifolds supplying primary air through the floor to the combustion chamber and said vertical ducts supply secondary air through the wall to the combustion chamber, a blower room adjacent said combustion chamber and separated therefrom by said second named wall, a blower in said blower room connected to deliver air to said air supply header, and a charging platform closing the top of said blower room and communicating with said charging opening.

3,869,995

INCINERATOR

John F. Straitz, III, Jenkintown, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Jan. 10, 1974, Ser. No. 432,215
Int. Cl. F23g *5/12*
U.S. Cl. 110—18 C **9 Claims**



1. A smokeless incinerator which comprises:
a base,
shell means comprising a cylindrical shell of metal having a side wall and with its cylindrical axis vertical,
said shell being open at the top to the atmosphere and for the deposit into the shell of solid waste materials for combustion,
said shell being mounted on and extending upwardly from said base,
means for supplying air under pressure into said shell means in a direction tangential to the side wall of said shell,
means for supplying combustible gas for tangential delivery into said shell,
a liquid ring contiguous to the top of said shell, and
a plurality of delivery pipes extending from said ring for delivery of liquid upwardly above the upper margin of said shell for admixture with the rising stream of gases from said shell.

3,869,996

METHOD AND APPARATUS FOR EXTENDING LIFE PERIOD OF FURNACE ROOFS

Viktor Mikhailovich Panferov, prospekt Mira, 112, kv. 157; Lev Petrovich Grunin, Znamenskaya ulitsa, 62, kv. 2; Lev Mikhailovich Ilin, Leninsky prospekt, 103, korpus 169, kv. 12; Mikhail Moiseevich Privalov, B.Dekabrskaya ulitsa, 1, kv. 49, all of Moscow; Andrei Dmitrievich Filatov, Oktyabrskaya ulitsa, 15, kv. 7, Magnitogorsk; Gennady Elizarovich Ovchinnikov, ulitsa Kalinina, 3, kv. 85, Magnitogorsk; Vadim Grigorievich Antipin, ulitsa Gorkogo, 19, kv. 11, Magnitogorsk; Viktor Andreevich Lednov, ulitsa Kalinina, 23, kv. 26, Magnitogorsk; Valery Fedorovich Tjurin, Ulyanovskaya ulitsa, 46, kv. 5, Moscow; Dmitry Samuilovich Rutman, Belorechinskaya ulitsa, 17, kv. 9, Sverdlovsk; Igor Pavlovich Basias, ulitsa Gagarina, 12, kv. 80, Sverdlovsk, and German Tomasovich Tile, Zavodskaya ulitsa, 32, kv. 37, Sverdlovsk, all of U.S.S.R.

Continuation of Ser. No. 292,823, Sept. 2, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,523
Int. Cl. F23m *5/06*
U.S. Cl. 110—99 R **6 Claims**

1. A method of extending the life of roofs on furnaces having relatively cold and hot periods in the course of a melting cycle, comprising: positively controlling stresses developing in said roof by simultaneously applying variable distributed vertical loads to the surface of said roof and variable bending moments to the edges of said roof and varying the loads and the moments at least twice in the course of the melting cycle.

3,869,997

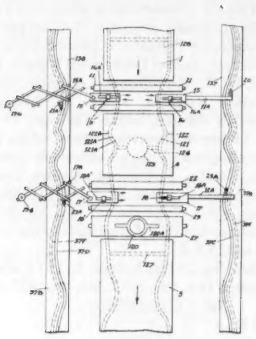
WEB CUTTING SEWING MACHINE AND PROCESS

Sidney German, 121 Third St., Chelsea, Mass. 02150

Continuation of Ser. No. 632,880, March 30, 1967, abandoned. This application Feb. 9, 1970, Ser. No. 9,104
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 **32 Claims**

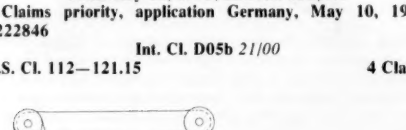
1. A sewing apparatus comprising first and second cutting stations, a sewing station and means for feeding a pair of superimposed flexible webs through said first cutting station and said sewing station to form a central strip having profiled edges sewn together and border strips adjacent said central strip having free edges congruent to said sewn profiled edges,

means transporting said strips from said first cutting station and said sewing station through said second cutting station for



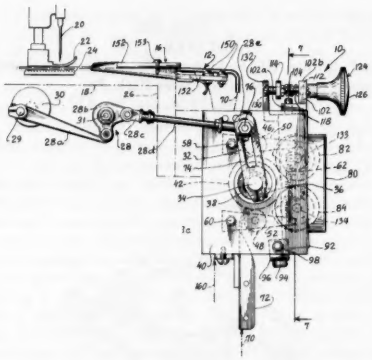
cutting the central strip into separate articles, and means for collecting the sewn articles and the unsewn borders.

3,869,998
SEWING DEVICE
Hans Scholl, Oerlinghausen-Lipperreihe, Germany, assignor to Kochs Adler AG, Bielefeld, Germany
Filed May 10, 1973, Ser. No. 358,840
Claims priority, application Germany, May 10, 1972, 2222846
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.15 **4 Claims**



1. In a sewing device with guided control of a sewing cycle, comprising a support means, a link arm, means swingably attaching said link arm to said support means, a supporting arm, a connecting arm pivoted on said link arm and said supporting arm, a template having internal corners, workpiece clamping means above said template, a driven magnetic roller engaged with the peripheral edge of said template, means attaching said magnetic roller on said supporting arm, a sewing machine carried by said supporting arm and having a vertically reciprocating needle coaxially with the said magnetic roller, and a supporting body carrying said workpiece clamping means and said template, shock absorbing means between said supporting body and said supporting means for limiting said supporting body to slide with respect to said support means when said template receives a relatively high shock by having said magnetic roller slam into an internal corner, said shock-absorbing means comprising an upper thrust washer having a bore, a lower thrust washer provided with a threaded sleeve for receiving said upper thrust washer, a spring for pressing said thrust washers against said supporting body, a bolt secured to said support means for slidably receiving said threaded sleeve, regulating nuts on said bolts for adjusting the tension of said spring and a recess formed in said supporting body for receiving said threaded sleeve.

3,869,999
TAPE SLITTING AND METERING DEVICE
Herbert Richter, P.O. Box 206, Kew Gardens, N.Y. 11415
Filed Oct. 3, 1973, Ser. No. 403,117
Int. Cl. D05b *23/00*
U.S. Cl. 112—121.26 **10 Claims**



1. A tape slitting and tensioning device for slitting tape made of rubber or other slittable material and feeding the slit tape under tension to a sewing machine having a plurality of needles, a work feed mechanism, and a drive mechanism operatively connected to said needles and work feed mechanism, said tape slitting and tensioning device comprising:

a. rotary tape slitting means adapted to slit tape into a plurality of separate strips,
b. said rotary tape slitting means being operatively connected to said sewing machine drive mechanism,
c. whereby the rotary tape slitting means operates in synchronization with the operation of the sewing machine needles and work feed mechanism,
d. tensioning means adapted to apply tension to the strips slit by the rotary tape slitting means, and
e. guide means adapted to guide the individual tensioned strips to the individual needles and work feed mechanism of the sewing machine,
f. said rotary tape slitting means comprising a first roller adapted to support tape,
g. a pair of idler rollers mounted on opposite sides of said first roller to hold the tape thereon in tensioned condition for the slitting operation,
h. a plurality of rotary cutters mounted for engagement with said first roller to slit a tape supported thereon into a plurality of strips,
i. said rotary cutters being mounted on parallel shafts which are parallel to the axis of the first roller, and
j. pressure means exerting equalized pressure upon said cutter shafts to equalize the cutting pressure of said rotary cutters against the first roller.

3,870,000

METHOD FOR THE MANUFACTURE AND POCKET'S ASSEMBLING

Jose Castany Ferre, Calle Borrell, No. 122, and Ramon Sanrama Padro, Calle Vilamari, No. 57, both of Barcelona, Spain

Filed Feb. 5, 1973, Ser. No. 329,421

Claims priority, application Spain, Feb. 5, 1972, 177178; Jan. 13, 1973, 410588

Int. Cl. D05b *21/00*

U.S. Cl. 112—262 **12 Claims**

1. A method for forming and assembling pockets on garments by stitching together superimposed cloth pieces by a known sewing machine, comprising clamping desired cloth pieces in a desired superimposed relationship by means of a clamping pattern having a contour edge portion corresponding to the desired shape of the stitch to be made, and moving said pattern and thus clamped cloth pieces with respect to said sewing machine with the presser foot of said sewing machine in guiding contact with respect to said contour edge portion of said pattern, while simultaneously stitching said clamped cloth pieces by means of the needle of said sewing machine, wherein said cloth pieces include a garment piece, a pair of pinched tuck pieces, a pair of pocket lining pieces and a pocket flap; wherein said pattern includes a base plate having therein a longitudinal slot with a width greater than the distance between the stitches of the two edges of the opening of the desired pocket and with a length greater than the width of the desired pocket, said pattern further including a pair of clamping plates, one each of which is pivotally mounted on opposite sides of said slot about an axis parallel to the longitudinal dimension of said slot; wherein said steps of clamping, moving and stitching comprise:

A. positioning said base plate on said garment piece with said slot aligned with that area of said garment piece wherein the opening of said pocket is desired;

B. placing a first of said pinched tuck pieces on said garment piece adjacent one of the longitudinal edges of said slot;

C. placing a first of said pocket lining pieces on said first pinched tuck piece;

D. pivoting a first of said clamping plates toward said base plate to clamp therebetween a portion of said first pinched tuck piece and said first pocket lining piece;

E. urging said first clamping plate against said presser foot and stitching said first pocket lining piece and said first pinched tuck piece to said garment piece, thereby forming a first pocket stitch;

F. placing a second of said pinched tuck pieces on said garment piece adjacent the opposite of said longitudinal edges of said slot;

G. placing said pocket flap on said second pinched tuck piece;

H. placing a second of said pocket lining pieces on said pocket flap;

I. pivoting a second of said clamping plates toward said base plate to clamp therebetween a portion of said second pinched tuck piece, said pocket flap and said second pocket lining piece;

J. urging said second clamping plate against said presser foot and stitching said second pocket lining piece, said pocket flap and said second pinched tuck piece to said garment piece, thereby forming a second pocket stitch; and

K. cutting said garment piece between said first and second pocket stitches to form said pocket opening.

3,870,001

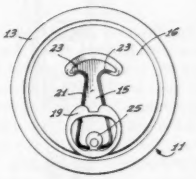
CAN END WITH INSEPARABLE TEAR STRIP

Omar L. Brown, Kettering, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio

Division of Ser. No. 103,255, Dec. 31, 1970, Pat. No. 3,757,989. This application Jan. 8, 1973, Ser. No. 322,070

Int. Cl. B21d *51/26*

U.S. Cl. 113—121 C **5 Claims**



1. A method of forming an easy open can end having an end wall and a removable tear portion in the end wall which is at least partially circumscribed by a score line in the can end, said method comprising:

coining a can end wall to define a planar coined border which at least partially circumscribes a tear portion;

forming a first offset surface in said can end which is inclined vertically to the plane of said coined border and lies outside of said border;

forming a second offset surface in said can end which is inclined vertically to the plane of said coined border and lies inside said coined border within said tear strip.

forming a score line within said coined border,

placing said score line between said first and second offset surfaces and sufficiently close to both of said offset surfaces to provide protection from the second offset surface against cuts from the sharp edge on the tear portion and protection from the first offset surface against cuts from the sharp edge remaining on the can end after severance of the can end along the score line in at least partial removal of the tear strip from the can end, and

said coined border being formed in a plane which is intermediate to the plane of said tear portion and the plane of the balance of said end wall.

3,870,002

TELEVISION CAMERA TUBE WITH THREE ELECTRODE FOCUSING LENS

Johannes H. T. Van Roosmalen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 176,016, Aug. 30, 1971, abandoned. This application Mar. 2, 1973, Ser. No. 337,441

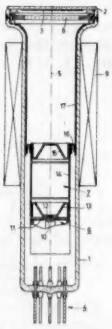
Claims priority, application Netherlands, Sept. 4, 1970, 7013099

Int. Cl. H01j *31/38, 29/56, 29/58*

U.S. Cl. 313—389 **1 Claim**

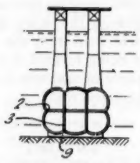
1. A television camera tube having, aligned along an axis, an electron gun having a cathode, a control grid and an anode provided with an aperture for producing an electron beam and a focusing lens for focusing the electron beam, a signal plate,

a photoconductive layer on said signal plate on which a potential distribution is formed by projecting on it an optical image, means to scan said photoconductive layer with said electron beam to produce electrical signals corresponding to said optical image, said focusing lens comprising a first electrode having a truncated conical portion, said anode forming a part of said first electrode, a second electrode, and a third electrode having a truncated conical portion the wide end of which faces the wide end of the first electrode, the second electrode being positioned between the wide ends of the first and third electrodes and having a diameter substantially equal to the largest diameter of the truncated conical portions of the first and third electrodes, said first electrode comprising a substantially



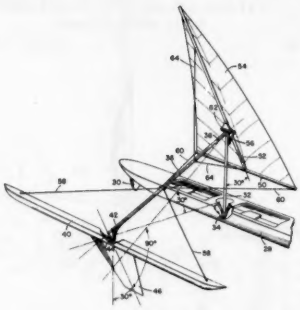
circular cylindrical part having an aperture with an area of minimum cross-section, and a substantially circular cylindrical part on the side of the second electrode, and said third electrode comprising a substantially circular part defining an aperture having an area of minimum cross-section on the side remote from the second electrode for restricting the cross-section of the electron beam, and a substantially circular cylindrical part on the side of the second electrode.

3,870,003
STORAGE-VESSEL
Olav Mo, Gronsundvlien 94, 1370 Asker, Norway
Filed July 10, 1972, Ser. No. 269,961
Claims priority, application Norway, July 9, 1971, 2632/71; Jan. 17, 1972, 84/72
Int. Cl. B63b *35/44*
U.S. Cl. 114—.5 T **4 Claims**



1. A semi-submersible vessel for loading, storing and transporting a liquid such as oil or the like, comprising: a main hull intended to lie on the sea bed during loading, unloading and storing of the liquid, said main hull being formed of a single monolithically formed air-tight hull which is divided into cargo compartments, the hull having outer walls formed as portions of cylindrical shells and a slim superstructure including columns rigidly supported by the hull, the columns extending upwardly from the said main hull to above the sea level when the main hull rests on the sea bed, said columns supporting a deck structure, the arrangement of the hull and the columns being such that the center of gravity of the vessel is always below the center of buoyancy of the vessel to provide the vessel with a total weight and a weight stability under all loading conditions to be able to rest on the sea bed without anchors, moorings or the like.

3,870,004
SAILING VESSEL
Donald W. Bailey, RFD 1, Bar Harbor, Maine 04609
Filed Dec. 20, 1973, Ser. No. 426,940
Int. Cl. B63b *39/00*
U.S. Cl. 114—39 **12 Claims**



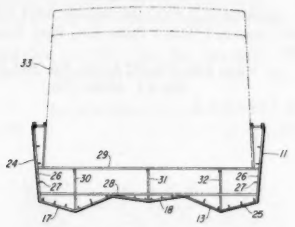
10. A sailing vessel comprising:
a. support means for supporting the sailing vessel,
b. kingpost means stepped in said support means, said support means being free to pivot about the lower end of said kingpost means;
c. a stabilizer element;
d. a blade element fixed to and depending downwardly from the undersurface of said stabilizer element, said blade element and said stabilizer element having their major dimensions in substantial alignment, said blade element being mounted on said stabilizer element at a fixed acute angle relative to the vertical;
e. a stabilizer arm pivotally attached at its lower far end to said stabilizer element, said pivotal attachment having a vertical axis;
f. a sail frame;
g. said kingpost means, said stabilizer arm and said sail frame being attached together, said stabilizer arm being maintained at a fixed acute angle relative to the horizontal, said stabilizer arm being pivotable about a vertical axis, and said sail frame being pivotable about a vertical axis;
h. a kitesail attached to said sail frame, said kitesail being positioned at said fixed acute angle relative to the vertical, the upper portion of said kitesail being angled on the stabilizer element side of said support means; and
i. control means attached to said stabilizer element and to said sail frame for pivoting said element and said frame about vertical axes whereby the course of the sailing vessel is steered.

3,870,005
HOUSEBOAT HULL
Richard E. Klingler, 1609 Spring Brook Dr., Ekhart, Ind. 46514, and Jeffrey A. Roberts, 55135 Belair, Osceola, Ind. 46561
Filed Dec. 12, 1973, Ser. No. 423,933
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 R **9 Claims**

1. A planing houseboat hull having a reverse cathedral configuration and comprising
a pair of spaced, substantially similar, generally V-shaped outer bottom surface members extending substantially for the full length of the hull each of which has a generally

V-shaped prow portion joined thereto projecting upwardly at an obtuse angle, said outer bottom surface members being of substantially uniform cross sectional area throughout their respective lengths and having a first predetermined included angle;

a generally V-shaped central bottom surface member extending substantially the full length of said hull situated between and joined to said outer bottom surface members and being of substantially uniform cross sectional area throughout its length, said central bottom surface member having a second predetermined included angle which is greater than said first included angle, and having



appreciably less draft than said outer bottom surface members;

a generally V-shaped central prow portion joined to said central bottom surface member and said outer prow portions, and projecting upwardly at an obtuse angle not exceeding about 155° relative to the hull waterline but at an angle which is greater than the angle of said upwardly projecting outer prow portions;

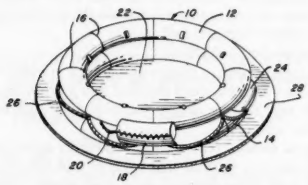
whereby said wetted surface below planning speed comprises said outer bottom surface members and said central bottom surface and at planing speeds the hull wetted surface consists essentially of said outer bottom surface members.

3,870,006

STABILIZING DEVICE FOR BUOYANT BODY

Masami Hashimoto, No. 2-6-Chome, Ojijyutaku 3-205, Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,111
Claims priority, application Japan, May 31, 1972, 47-54051
Int. Cl. B63b *43/04*
U.S. Cl. 114—121 **11 Claims**



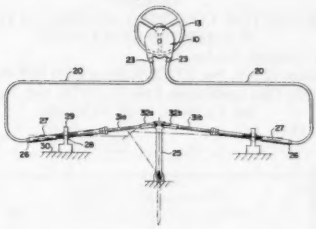
8. A raft comprising a gas-tight inflatable container made of rubberized cloth; a section of airtight flaccid material attached to the bottom portion of said container and constructed so that when said raft is inflated and floats upon the surface of a body of water, said section of material extends beyond substantially all of the periphery of said container and contacts the water, said section effecting a partial vacuum between the bottom of said container and said body of water as said container floats upon the surface of said body of water whereby said container resists overturning in said body of water.

3,870,007

RUDDER CONTROL CABLE SYSTEM

John F. Morse, 1699 Hines Rd., Hudson, Ohio 44236

Filed Oct. 10, 1973, Ser. No. 405,042
Int. Cl. B63b *25/10*
U.S. Cl. 114—160 **6 Claims**



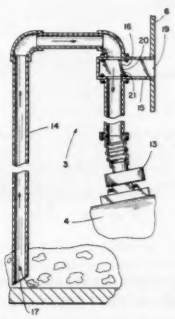
1. In a boat structure having an oscillatable rudder arm which swings arcuately about one end from a medial steering position to extreme turning positions at the ends of its arc, a remote steering control, and a closed loop push-pull cable including a casing and cable core for transmitting motion from said steering control to said rudder arm and having opposing ends of said casing swivel mounted on the boat structure adjacent the rudder arm, the improvement comprising means connecting the two ends of the cable core in a substantially straight line path between said swivel mounts at a selected position on the arc of the arm to two pivots on the free end of said arm, said pivots spaced apart on the arc of said free end a distance which compensates for the change in the cable core path as the arm swings through its arc.

3,870,008

ENGINE VENTILATION OF BOAT BILGES

Edward D. Wilkerson, P.O. Box 755 South Court, Normandy Beach, N.J. 08739

Filed Nov. 21, 1973, Ser. No. 417,944
Int. Cl. B63b *13/00*
U.S. Cl. 114—211 **8 Claims**



1. In a system for ventilating the bilge of a closed boat which is powered by a confined inboard gasoline engine having a down draft carburetor supplied by an air source, the improvement in the carburetor aspirating air source comprising an air passage conduit extending from a low level of the bilge to an air inlet of the carburetor to provide a first carburetor aspirating air source, and a normally closed valve actuatable to an open position in response to a predetermined air pressure differential, said valve being located in a second fluid passage conduit to close normally said second passage when air flow occurs in the first passage with the valve opening to draw air

from open atmosphere through the second passage in response to an obstruction in the first air passage which produces the predetermined air pressure differential, whereby the bilge supplies carburetor aspirating air until an obstruction occurs at which time air is then supplied by open atmosphere.

3,870,009

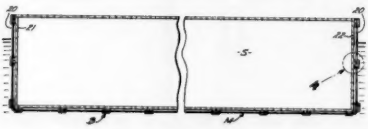
PROTECTIVE COVERING APPARATUS FOR A SUBMERGED STRUCTURE

Orval E. Liddell, Avalon, Calif.

Division of Ser. No. 837,259, June 27, 1969, Pat. No. 3,581,305. This application Feb. 16, 1971, Ser. No. 115,831

Int. Cl. B63c *1/00;* **E03c** *3/00*

U.S. Cl. 114—222 **5 Claims**



1. Protective covering apparatus for a submerged structure, comprising:

a pliable, generally waterproof sheet;

a plurality of battens;

attachment means for securing said battens to spaced portions of said structure to define a plurality of independent modules; and

seal means interposed between said battens, said sheet and said structure whereby circulation of water in the space defined by said modules and the ambient water outside said modules is restricted to thereby maintain the water in said space stagnant to marine borer attack on the submerged portion of said structure.

3,870,010

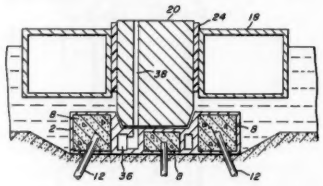
MOORING SYSTEM FOR FLOATING STRUCTURES

Everald V. Wright, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Sept. 4, 1973, Ser. No. 394,200

Int. Cl. B63b *21/00*

U.S. Cl. 114—230 **5 Claims**



1. A mooring system for securing floating structures to the bottom of a body of water subject to waves or tidal action, comprising:

a base unit having a cavity therein and a tapered recess in the top surface thereof;

means for fixing the base unit to the bottom including ballast, sleeves formed in the base unit, and piling driven through the sleeves into the bottom;

a mooring unit with a shaft therein, located so as to provide access to the cavity in the base unit, and a lower surface having a tapered protrusion sized and shaped to fit the tapered recess in the base unit, said mooring unit being movably attached to the floating structure so as to allow relative vertical movement between the mooring unit and the floating structure;

means for securing the mooring unit to the base unit, whereby the floating structure is horizontally restrained, but can move vertically in response to waves or tidal action, which securing means includes tubes disposed within the base unit and the mooring unit, with post-tensioning strands passing through the tubes, and anchorages within the base unit cavity and above the mooring unit, whereby the post-tensioning strands are secured by the anchorages of the base unit and the mooring unit; and

means for sealing the second matable portion to the first matable portion so as to allow dry access through the shaft and cavity.

3,870,011

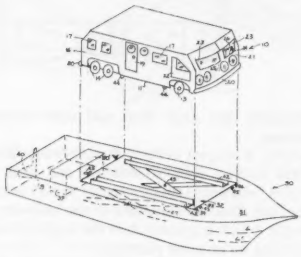
COMBINED MOTOR HOME AND YACHT

Herbert Cooper, 1 Tom's Point Ln., Port Washington, N.Y. 11056

Filed July 27, 1973, Ser. No. 383,376

Int. Cl. B63h *1/00*

U.S. Cl. 115—0.5 A **6 Claims**



1. A vehicle comprising:

a road-traveling module including

a chassis,

living quarters on said chassis,

an access door at said living quarters and having a lower edge,

a pair of road-engaging front wheels spring-mounted on said chassis,

a pair of road-engaging rear wheels spring-mounted on said chassis,

an engine on said chassis for driving one of said pairs of said wheels and thereby propelling said module along the ground, and

a driver's station on said chassis having a steering wheel operatively connected to said front wheels to pivot same and steer said module on the ground and a marine control element; and

a floatable hull including

independent drive means including a marine engine operable by said control element and a propeller connected to said marine engine for displacing said hull through the water,

a deck formed with a single upwardly open well adapted to receive both of said pairs of said wheels and having a well edge formed as a seat snugly engageable all around said module with said chassis with the weight of said module distributed along said well edge,

jack means in said well having a pair of lift elements each engageable with a respective one of said front wheels and with a respective one of said rear wheels for lifting and lowering said module by said wheels out of and into said well,

a marine steering element on said hull operable to steer same in the water,

means operatively connected between said front wheels and said marine steering element for steering said hull

in the water from said steering wheel only with said module resting on said seat,

means operatively connected between said marine control element and marine engine for controlling same only with said module on said seat, and

means for securing said chassis to said seat in a predetermined stable position with said lift elements out of engagement with said wheels and said lower edge of said door lying substantially on the same level as said deck with said module resting on said seat in said predetermined stable position.

3,870,012

PRESSURE DROP ALARM DEVICE

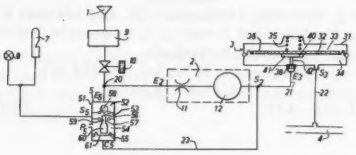
Robert Metivier, 49 rue du Docteur Blanche, Paris, France (75016)

Filed Oct. 15, 1973, Ser. No. 406,469

Claims priority, application France, Oct. 16, 1972, 72.36582

Int. Cl. G01l *19/12*

U.S. Cl. 116—70 **8 Claims**



1. A pressure drop alarm device; particularly but not exclusively for use with automatic respiration apparatus, and associated with and between a feed or supply conduit for fluid under pressure and a source of pressure fluid, the device indicating that, after a certain preselected period, the pressure in the feed conduit has failed to reach a predetermined maximum P, wherein the device functions pneumatically and wherein the source of pressure fluid is connected to a timing device having an outlet connected to the feed conduit via a manometric capsule which is normally closed and which opens when the pressure in the said feed conduit reaches the maximum pressure P in order to evacuate pressure fluid from the timing device, the said outlet of the timing device also being connected to a pneumatic cell with a logical function "YES" normally closed to prevent the feed of fluid from the said source to at least one alarm, and opened to actuate the or each alarm if the pressure in the timing device exceeds a certain preselected threshold P_{r1} caused by manometric capsule remaining closed due to the pressure in the feed conduit failing to reach the said maximum pressure P

3,870,013

APPARATUS FOR DEPOSITING FLOWABLE MATERIAL

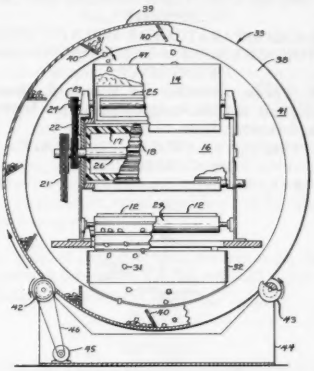
Richard C. Wagner, Darien, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed June 4, 1973, Ser. No. 366,369

Int. Cl. B05c *5/00*

U.S. Cl. 118—24 **3 Claims**

1. Apparatus for depositing a flowable material on a travelling series of articles having spaced adjacent peripheries, comprising: conveyor means for transporting said articles through a depositing station; dispensing means above said conveyor means at said depositing station for depositing said material by gravity fall from the dispensing means onto the articles as said articles are transported through said station with some of said material falling beyond and between said peripheries of said articles; a receiving hopper means above and communicating with said dispensing means for supplying material from said hopper by gravity flow to said dispensing means; a recovery means beneath said station for recovering said portions of material falling beyond and between said peripheries of said articles and including a rotatable recovery collecting member extending beneath the depositing station and above said dispensing means, said recovery collecting member having a solid circular periphery and peripherally adjacent pockets therein facing inwardly toward both said



receiving hopper and said depositing station; and means for rotating said recovery collecting member and thereby elevating said material collected in said pockets to a position above said dispensing hopper for returning said recovered material by gravity fall successively from said pockets into said receiving hopper.

3,870,014

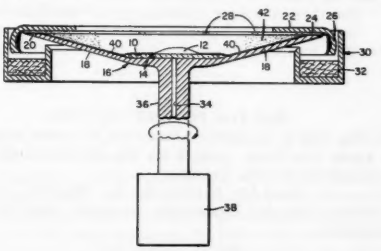
LIQUID AND AEROSOL COLLECTING DEVICE

Robert T. Buck, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed May 24, 1973, Ser. No. 363,393

Int. Cl. B05c *11/08*

U.S. Cl. 118—52 **5 Claims**



1. A liquid and aerosol collecting device comprising

a dish-like member having sloped walls and a horizontally extending lip along the outer peripheral edge of said sloped walls, said dish-like member being adapted to accommodate and support a liquid receiving member having at least one flat surface adapted to receive a liquid thereon,

a circular member having a horizontally extending annular portion disposed closely adjacent said lip so as to define a passage between one surface of said circular member and said lip and a depending portion encompassing said lip,

means for spinning said dish-like member and said liquid receiving member together about an axis substantially perpendicular to said one flat surface so that at least a portion of any liquid disposed on said one flat surface is caused to flow off an edge of said member, at least a

portion of any aerosol of said liquid that is formed being recombined with said portion of said liquid, and

means for collecting said liquid operatively associated with said dish-like member and said circular member.

3,870,015

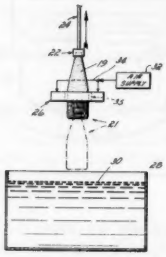
METHOD AND APPARATUS FOR APPLYING PLASTISOL COATING OF UNIFORM THICKNESS TO GLASS CONTAINERS

William L. Brown, Amanda, and Francis J. Shonebarger, Lancaster, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Oct. 23, 1973, Ser. No. 408,617

Int. Cl. B05c *11/06*

U.S. Cl. 118—63 **18 Claims**



8. An apparatus for uniformly coating a plastic material onto a glass container having a finish portion for receiving a closure, said apparatus comprising, in combination:

means for immersing the container in a bath of liquid uncured plastic material;

a source of pressurized gas;

a fixture including an inwardly and downwardly directed annular orifice;

a gas conduit communicating between said source and said orifice to permit gas to flow through said orifice to form a thin conical sheet of gas moving toward an apex; and

moving means for gripping the container at the finish portion thereof and for withdrawing the container from the bath and passing it upwardly through said annular orifice so as to move through the thin conical sheet of gas.

3,870,016

BOX FOR POWDER COATING

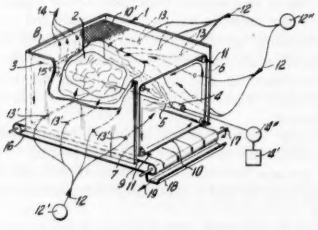
Dr.-Ing. Udo U. Schneider, Kressbronn, Germany, assignor to Firma Otto Durr, Anlagen fur Oberflachentechnik, Stuttgart-Zuffenhausen, Germany

Filed July 3, 1972, Ser. No. 268,766

Claims priority, application Germany, July 2, 1971, 2132946

Int. Cl. B05b *15/00*

U.S. Cl. 118—309 **10 Claims**



1. In a box for powder coating of a workpiece, of the type having a front wall, side walls, a rear wall, a base and a top wall, and nozzle means in the front wall operable to direct an air-powder stream, substantially centrally and horizontally of the box, toward a workpiece in the box, positioned on the axis of the air-powder stream, to provide a powder cloud surrounding the workpiece, the improvement comprising, in combination, air inlet means in said side walls; means connected to said air inlet means and producing air flows directed through said air inlet means substantially tangentially of said powder cloud to impart thereto a supporting rotary motion maintaining said powder cloud about said axis and the workpiece and counteracting the force of gravity on said powder cloud; air outlet means in said rear wall substantially symmetrical with said axis for discharge of the air flows carrying excess powder from said powder cloud; conveyor means receiving powder carried toward the walls of said box and delivering the received powder to said rinsing air flows for return thereby to said powder cloud; and a conveyor device adjacent said base receiving any powder falling onto said base and removing the received powder to prevent powder accumulation onto said base.

3,870,017

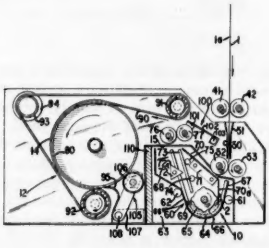
PHOTOPRINT DEVELOPING APPARATUS AND METHOD

Francis L. Kratcoski, Lincolnshire, Ill., and Adrianus H. Willemse, Grubbenvorst, Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed June 26, 1974, Ser. No. 483,319

Int. Cl. G03g *13/08*

U.S. Cl. 118—637 **16 Claims**



1. An apparatus for developing an electrostatic charge pattern on a support sheet by inductive attraction thereto of particles of an electrically conductive developing powder, including a container for holding a mass of said powder and having therein lower and upper means extending partially within and partially outside the space occupied by the powder and spaced apart therewithin to define a path for movement of the sheet through the powder mass, and means for transporting the sheet into and along said path and thence out of said container, the improvement which comprises said upper means being constituted by an electrically conductive organ having a cylindrical peripheral outline that is regularly profiled as viewed in circumferential direction, said organ being rotatable to move its periphery in the direction of the movement of the sheet through said path so that its profiles will displace powder from the sheet exit region of said space toward the sheet entry region thereof.

3,870,018

FISH GROWING TANK

Ernst August Fruchtnicht, Heidesee 28, 2138 Scheebel, Germany

Filed June 1, 1973, Ser. No. 365,968

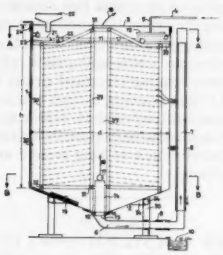
Claims priority, application Germany, June 5, 1972, 2227206

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **15 Claims**

1. A fish growing tank comprising means defining a tank with a nominal water level, means for water supply to the tank,

means for evacuation of water comprising an adjustable overflow conduit connected to an evacuation hole in the bottom of the tank, and

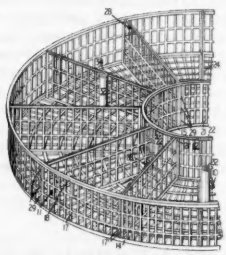


means defining a latticed dome having a height greater than the span across it located in the bottom of the tank with its top terminating substantially below said nominal water level height.

3,870,019
OYSTER CULTURE BASKET

Douglas McNicol, R.R. No. 2, River Denys, Nova Scotia, Canada

Continuation-in-part of Ser. No. 129,547, March 30, 1971, abandoned. This application May 3, 1973, Ser. No. 356,795
Claims priority, application Canada, Feb. 10, 1971, 104977
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **17 Claims**



1. A basket suitable for the culturing of shellfish, and having a bottom, an upstanding outer wall surrounding said bottom, the bottom having a hole with a diameter of at least several inches which diameter is greater than the height of said outer wall, an inner wall of substantially the same height as the outer wall surrounding said hole, said bottom and said walls being apertured to allow for circulation of water, the basket further including at least three dividers extending between the said inner and outer walls, said dividers extending substantially the full height of the basket and dividing the basket into at least three segments surrounding said hole, each segment occupying less than the full width of the basket.

3,870,020
SYSTEM FOR GROWING SHELLFISH

George R. Hunt, Mahtomedi Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 203,155, Nov. 30, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,933
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **4 Claims**

1. A method for growing oysters to merchandizable maturity comprising supporting immature oysters on cultch in an aquatic growth medium at a concentration of from two to ten oysters per gallon, maintaining said medium at a temperature of 18°–25°C. and a salinity of 15-35 parts per thousand, supplying to said oysters a foodstock nutritionally-equivalent to *C. nana*, and regulating the rate of supply of said foodstock to avoid a concentration or turbidity greater than that of 5×10^5 cells of C. nana per ml. while providing a daily ration as expressed by the equation

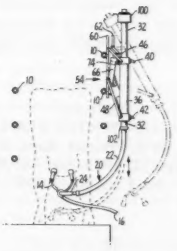
$$C = Ah^2$$

wherein C = no. of cells of *C. nana* per oyster per day, A = a feeding constant between 0.3×10^6 and 1.25×10^6, and h = average height of the oysters in mm.

3,870,021
AUTOMATIC CONTROL FOR MILKING MACHINE SUPPORT STRUCTURE

Frits W. Nederbragt, Petaluma, Calif., assignor to Ross-Holm, division of Holm Tractor & Equipment Company, Petaluma, Calif.

Filed Nov. 29, 1973, Ser. No. 420,205
Int. Cl. A01j *7/00*
U.S. Cl. 119—14.13 **18 Claims**



1. An improved automated milking system of the type having milking cluster elements attached to the teats of a cow's udder, wherein the improvement comprises means for sensing a change in the pulling forces on the teats of the cow's udder exerted by the cluster elements and for producing an output signal representative of the change in at least one of the pulling forces and means attached to the milking cluster elements and responsive to the output signal for varying the pulling forces of the cluster elements on the cow's teats until the output signal indicates that the pulling forces on the teats exerted by the cluster elements are within a predetermined range.

3,870,022
POULTRY WATERING DEVICE

Harold W. Hart, Glendale, Calif., assignor to H. W. Hart Mfg. Co., Glendale, Calif.

Filed Mar. 19, 1973, Ser. No. 342,387
Int. Cl. A01k *39/02*
U.S. Cl. 119—75 **18 Claims**

1. A poultry drinking cup comprising:
a cup body having an input opening means;

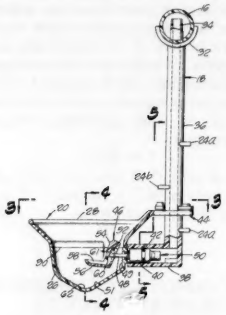
valve means to control the flow of water through said input opening means into the cup body;

a snap-fitting member formed integrally with said cup;

said snap-fitting member including resilient engaging means which define an expandable cavity;

said cavity being shaped and positioned to clamp said water feed line or said support member through resilient expansion of said cavity to at least partially enclose said feed line or said support member with said cavity then undergoing resilient contraction to clamp said water feed line or said support member,

whereby the poultry drinking cup may be readily connected to a water feed line by connecting the input opening means with the water feed line and engaging the snap-fitting member with the water feed line or the support member to resiliently enlarge the cavity in the snap-fitting member with the cavity then undergoing resilient contraction to clamp said water feed line or said support member.



3,870,023

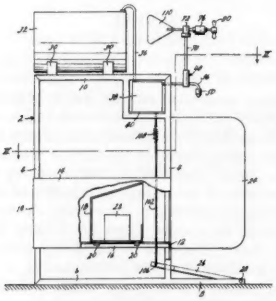
INSECTICIDE APPLICATOR FOR LIVESTOCK

Rolland E. Wilson, Rt. 1, Prescott, Kans. 66767

Filed Sept. 12, 1973, Ser. No. 396,354

Int. Cl. A01k *29/00*

U.S. Cl. 119—159 **5 Claims**



1. An insecticide applicator for livestock comprising:

a. a frame,

b. an insecticide reservoir carried by said frame,

c. a spray nozzle carried by said frame and operable to direct a spray against an animal standing in a use position relative to said frame, said nozzle being interconnected to said reservoir to receive insecticide therefrom, and

d. a control system including actuating means operable by the presence of an animal in said use position to cause operation of said control system to deliver insecticide from said reservoir to said nozzle, said control system comprising a pump operable when actuated to deliver insecticide from said reservoir to said nozzle, an electric motor operable to drive said pump, an operative electrical circuit for said motor, a normally open first switch in said motor circuit, electrically operated switch closing means operable to close said first switch whenever energized, electrically operable switch opening means operable to open said first switch a predetermined time after it is energized, even when said switch closing means is energized, an operating electrical circuit for said switch closing and switch opening means, and a normally open mechanical switch disposed in said last-named circuit, operation of said actuating means being operable to close said mechanical switch as long as said animal occupies said use position.

3,870,024

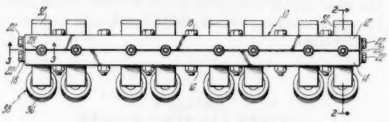
ROCKER ARM STUD SUPPORT DEVICE

Ralph H. Ridgeway, 17 Pine Dr., North Wilbraham, Mass. 01067

Filed Jan. 21, 1974, Ser. No. 435,287

Int. Cl. F01l *1/18*

U.S. Cl. 123—90.41 **7 Claims**



1. Apparatus for preventing undesired movements of internal combustion engine valve operating members comprising:

rocker arm stud extension means, said extension means adjustably engaging each of a plurality of linearly aligned rocker arm studs, engine valve clearance adjustments resulting from movement of said extension means on the studs;

locking means for preventing vibration induced rotational movement of said extension means on the studs;

elongated bar means, said bar means defining a plurality of spaced apertures, said bar means apertures circumscribing each of said stud extension means of a linearly aligned array of rocker arm studs for preventing deflectional motion of the studs, said bar means apertures being sized so as to define a clearance between said stud extension means and the walls of said apertures whereby rotational movement of said extension means is not impeded by said bar means; and

bracket means, said bracket means comprising a pair of opposed brackets adapted to respectively engage opposite ends of and solely support said bar means on an engine.

3,870,025

METHOD AND APPARATUS FOR IMPROVING THE FUEL INJECTION CHARACTERISTICS OF INTERNAL COMBUSTION ENGINES

Harold Elden Anderson, Playa del Rey, and Perry Lester Kruckenberg, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed July 5, 1972, Ser. No. 269,231

Int. Cl. F02d *1/04, 1/06;* **F02m** *39/00*

U.S. Cl. 123—139 AF **20 Claims**

1. In a method of effecting combustion in internal combustion engines, which method is characterized by:

generating, within internal combustion engine means, and in energy communicating relation with engine piston means movable in cylinder means of said engine means, a plurality of generally mutually distinct burning loci, with said burning loci defining generally spaced centers of burning;

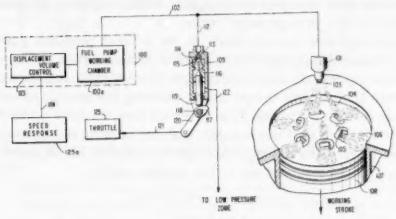
concurrently, and during a working stroke of said engine piston means,

transmitting combustion supporting gas, heated by compression and combustion, into said burning loci, and

generating and transmitting streams of combustible fuel into said burning loci,

each said burning loci substantially receiving at least one of said fuel streams and at least some of said heated gas; limiting the time duration of the generation of said fuel streams so that at least the majority of fuel in said streams passes into said burning loci during a working stroke of said engine piston means;

providing a plurality of spaced wall means, with each such wall means peripherally confining and defining



a fuel and heated gas agitation zone individually associated with and communicating with a said burning loci; each said peripherally confined agitation zone and a burning loci associated therewith receiving fuel from at least one fuel stream directed thereinto during said working stroke of said engine piston means;

maintaining the existence and a generally discrete relation of said burning loci during said working stroke of said engine piston means; and

utilizing energy generated through operation of said burning loci to induce said working stroke of said engine piston means;

the improvement comprising:

causing fuel pump piston means to displace an increment of fuel from fuel pump means;

transmitting said displaced increment of fuel through passage means leading from said fuel pump piston means to fuel injection nozzle means operable to generate said fuel streams, with said fuel injection nozzle means being operable to pass said fuel streams into said agitation zones and burning loci associated therewith;

discharging said fuel streams from said nozzle means into said agitation zones and burning loci associated therewith at a rate different from, and slower than, the rate of displacement of said fuel increment from said fuel pump means into said passage means; and

at a relatively lower engine speed for any given load condition

displacing a relatively larger volume fuel increment per working stroke of said engine piston means from said fuel pump means into said passage means, and

diverting fuel delivered by the fuel pump means into said passage means, between said fuel pump piston means and said injection nozzle means, from said passage means, and

at a relatively higher engine speed for any given load condition

displacing a relatively smaller volume fuel increment per working stroke of said engine piston means from said fuel pump means into said passage means, and

at least reducing the degree of said diversion of fuel from said passage means, and

said steps of displacing and diverting being operable to substantially avoid an undesirable mismatching of the time duration of discharge of said fuel streams into said agitation zones, in relation to a desired increment of movement of said engine piston means.

3,870,026

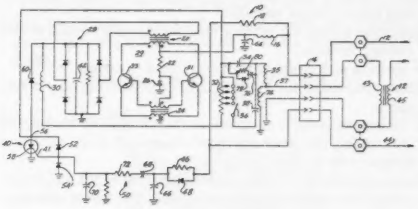
CAPACITIVE DISCHARGE IGNITION SYSTEM HAVING PROTECTIVE UNIDIRECTIONAL CIRCUIT

Christopher A. Jacobs, 3570-½ Eagle Rock Blvd., Los Angeles, Calif. 90065

Continuation-in-part of Ser. No. 866,626, Oct. 15, 1969, Pat. No. 3,716,037. This application Nov. 29, 1972, Ser. No. 310,256

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 R **3 Claims**



1. An ignition system for internal combustion engines comprising:

a cource of electrical power;

capacitive means for storing electric power coupled to the power supply;

an ignition coil coupled to the capacitive means;

means coupled to the ignition coil for producing and electric spark;

an electronic switch having an anode and a cathode coupled to the capacitive means for controlling the discharge and charge of the capacitive means;

engine controlled switching means coupled to the electronic switch for periodically operating said switch to produce discharge of the capacitive means; and

unidirectional circuit means backbiased to a predetermined threshold voltage connected to the electronic switch for conducting high voltage spike signals away from the anode of said electronic switch and thereby protecting said electronic switch.

3,870,027

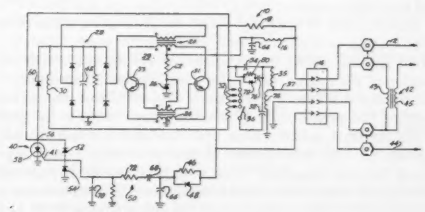
CAPACITIVE DISCHARGE IGNITION SYSTEM HAVING VARIABLE VOLTAGE INVERTER

Christopher A. Jacobs, 3570½ Eagle Rock Blvd., Los Angeles, Calif. 90065

Continuation-in-part of Ser. No. 866,626, Oct. 15, 1969, Pat. No. 3,716,037. This application Nov. 29, 1972, Ser. No. 310,273

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 R **2 Claims**



1. An ignition system for internal combustion engines comprising:

a source of electric power;

a variable voltage inverter coupled to the power source, the inverter including a pair of saturable transformers having coupled primary windings, each of said transformers going into saturation during starting of the engine with which the ignition system is used whereby inverter operation is provided with a voltage characteristic such that the voltage supplied by the inverter is maximum at engine cranking speeds in a range of 0 RPM to approximately 250 RPM, is inversely proportional to engine speed in the range of approximately 250 RPM to approximately 750 RPM, and remains approximately constant throughout the range of normal engine running speeds above 750 RPM at at a voltage level less than the voltage levels at said lower engine speeds;

capacitive means for storing electric power coupled to the voltage inverter;

an ignition coil coupled to the capacitive means;

means coupled to the ignition coil for producing an electric spark;

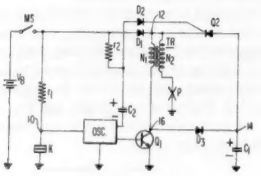
an electronic switch coupled to the capacitive means for controlling the discharge and charge of said capacitive means; and

engine controlled switching means coupled to the electronic switch for periodically operating said electronic switch to produce discharge of the capacitive means.

3,870,028
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yoshio Ishida, Osaka, Japan, assignor to Diamond Electric Mfg. Co., Ltd., Osaka, Japan

Filed Apr. 18, 1973, Ser. No. 352,362
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **5 Claims**



1. An ignition system for internal combustion engines comprising an ignition transformer means having a primary and a secondary winding, and said primary winding being grounded at one end thereof through a transistor and connected at the other end thereof to a DC source through a diode, said the other end of said primary winding being further grounded through a thyristor and a capacitor connected in series, and said secondary winding being connected at one end thereof to an ignition plug, an oscillator means for generating at least one pulse having a predetermined pulse width every predetermined ignition timing of the engine in synchronism with the rotation of the engine, means for coupling the output pulse of said oscillator means to the base of said transistor, means for coupling the output pulse of said oscillator means to the gate of said thyristor, said thyristor, said transistor and said primary winding of said transformer means providing a discharge circuit for said capacitor when both said transistor and said thyristor are rendered conductive substantially simultaneously in response to the application of the output pulse from said oscillator means, and means for charging said capacitor by a counter electromotive force produced in said primary winding of said transformer means when said transistor in the conducting state is rendered non-conductive.

3,870,029
ENGINE SUPERCHARGING AIR COOLING METHOD

James E. Crook, Speedway; John F. Cutler, Jr., and Jai K. Khanna, both of Indianapolis, all of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Division of Ser. No. 269,062, July 5, 1972, Pat. No. 3,796,047.
This application Jan. 7, 1974, Ser. No. 431,312
Int. Cl. F02b *33/00*
U.S. Cl. 123—119 CD **4 Claims**

1. A method of treating intake air for an internal combustion engine comprising

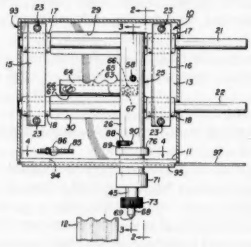
first compressing ambient air to a first pressure ratio which results in a first high temperature of the compressed air, cooling said compressed air by passing it through an air to air intercooler to a second temperature significantly lower than said first temperature while retaining approximately the first pressure ratio,

expanding said compressed air to a final pressure ratio considerably lower than said first pressure ratio to bring its temperature to a third temperature significantly lower than said second temperature, utilizing the energy of said expansion to the said final pressure ratio to draw ambient air through said intercooler, without heating the ambient air prior to its passage through the intercooler, transmitting said expanded air to the engine intake.

3,870,030
GRINDING WHEEL DRESSER

Phillip A. Sollami, 438 Sherman St., Downers Grove, Ill. 60515

Filed Nov. 5, 1973, Ser. No. 412,709
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 TP **8 Claims**



1. Apparatus for use in dressing the peripheral working surface of a grinding wheel to a predetermined contour, comprising

a base member adapted to be mounted in fixed relationship to the axis of rotation of a grinding wheel to be dressed, a tool holder carriage,

means mounting said carriage for reciprocable movement along a rectilinear path parallel to said axis of rotation of said grinding wheel,

motor means for driving said carriage back and forth along said path,

a dressing bit holding member carried by said carriage for guided movement in a direction perpendicular to said path,

an advance screw being carried by said carriage and held against rotation relative thereto,

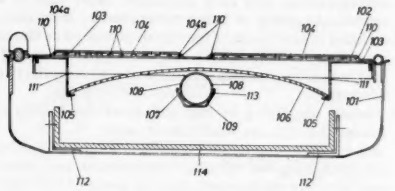
a template mounted to said base member,

a template follower connected to said advance screw, and means carried by said bit holder carriage and intermittently operated in response to the reciprocation of said holder relative to said base member for intermittently rotating said bit holding member relative to said advance screw to intermittently advance said bit holding member and to rotate said dressing bit.

3,870,031
GAS HEATED GRILL DEVICE

Aloys Kruper, Menden, Germany, assignor to Firma Gebr. Cramer, Menden, Fingerhutsmuhle, Germany

Filed Mar. 16, 1973, Ser. No. 342,138
Claims priority, application Germany, Mar. 24, 1972, 7211234
Int. Cl. F24c *3/04*
U.S. Cl. 126—39 J **4 Claims**



1. An improved gas heated grill device comprising in combination:

a housing having at least one cooking plate adapted for cooking in utensils, said cooking plate including a plurality of spaced-apart openings around its cooking area formed in a sloped edge of the plate;

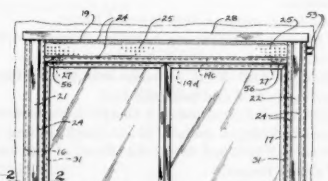
a grill pan located below said cooking plate;

a gas burner located in said housing between said cooking plate and said grill pan, a metal screen disposed between said burner and said at least one cooking plate, said burner being provided with nozzles disposed for the direct heating with flames of said screen to produce infrared rays, said screen being constructed and arranged for radiating infrared heat simultaneously in two principal directions, downwardly toward said grill pan and upwardly toward said cooking plate, and a pair of spaced apart lateral brackets depending from the cooking area and having angular arms for supporting the edge of said screen, said brackets including bores for enhancing the air circulation upwardly toward the opening of the cooking plate.

3,870,032
FIREPLACE FRONT OR SCREEN

John E. Lydle, and Charles F. Yakubik, both of Akron, Ohio, assignors to The Thermo-Rite Mfg. Co., Akron, Ohio

Filed Nov. 3, 1972, Ser. No. 303,459
Int. Cl. F24c *15/36*
U.S. Cl. 126—202 **10 Claims**

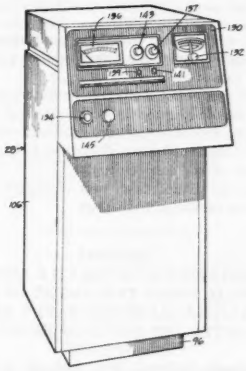


1. A frame for a fireplace screen, adapted to fit over a rectangular opening of a fireplace to be in front of a fuel burning space thereof, comprising; a rigid rectangular supportive frame having front and rear face portions, and including self-supportingly rigid top, bottom, and opposite-side supportive strips, fixedly connected and defining a frame opening therethrough; separate top, bottom and side decorative facing strips of thin material, complementally fitting over said front face portions of the supportive strips of said frame; and interengaging means on said supportive frame and said facing strips for complementally securing the same together, at least one of said supportive strips and its complementary facing strip defining a hollow draft air containment chamber with its facing strip including draft openings communicating with said chamber and being arranged in keeping with the decor of said decorative facing strip.

3,870,033
ULTRA PURE WATER PROCESS AND APPARATUS

Terry Lee Faylor, Santa Clara, and Roger W. Martin, San Jose, both of Calif., assignors to Aqua Media, Sunnyvale, Calif.

Filed Nov. 30, 1973, Ser. No. 420,703
Int. Cl. F24h *1/20*
U.S. Cl. 126—360 R **5 Claims**



1. A heat exchanger system for producing hot, deionized water and comprising,

inlet supply means for supplying water deionized to an electrical resistivity at the supply temperature equivalent to a resistivity in the range of 16–18 megohms for water at 25° C.,

heat exchanger means for heating said deionized water to a temperature in the range of 160°–190° F. while retaining said electrical resistivity at the heated temperature equivalent to 15–18 megohms at 25° C., and

outlet means for conducting the hot (160–190° F.) deionized (15–18 megohms equivalent) water from the heat exchanger means to a point of use.

3,870,034
PERSONAL GALVANIC SKIN RESPONSE MONITORING INSTRUMENT

J. Michael James, Cambridge, Mass., assignor to Cyborg Corporation, Boston, Mass.

Filed Mar. 26, 1973, Ser. No. 345,463
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1 Z **6 Claims**

1. A device for indicating changes in electrical resistance in the skin of a human subject, comprising

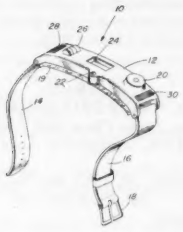
a. a casing of a size and shape adapted to be worn on a wrist of said subject and having an inner and an outer face,

b. wrist band means connected to said casing for detachably engaging the inner face of said casing to said wrist,

c. a pair of exposed electrodes mounted in fixed spaced relation to the outer face of said casing and adapted to be

touched by two different fingers of said subject, said electrodes being substantially flush with the outer face of said casing and of a size and shape to be covered by an average fingertip

d. a source of electrical power mounted to said casing and connected to said electrodes for establishing a potential difference between said electrodes,



e. first means responsive to the current flowing between the electrodes for deriving a signal related to the skin resistance of said subject,

f. a variable frequency oscillator mounted to said casing,

g. second means responsive to the derived signal for controlling the frequency of said oscillator whereby the frequency of said oscillator will vary with changes in the skin resistance of said subject, and,

h. third means coupled to said oscillator for indicating changes in oscillator frequency.

3,870,035

METHOD AND APPARATUS FOR SELF-ADMINISTERING PRE-HOSPITAL PHASE TREATMENT OF CORONARY PRONE INDIVIDUALS IN THE EARLY MINUTES OR HOURS AFTER THE ONSET OF HEART ATTACK SYMPTOMS

Stanley J. Sarnoff, Bethesda, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Continuation of Ser. No. 55,647, July 17, 1970, abandoned. This application Oct. 12, 1972, Ser. No. 296,841

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 T **13 Claims**

7. A method for effecting pre-hospital phase self-administered treatment of a coronary prone individual at a time during the early minutes or hours after the onset of heart attack symptoms and for enabling qualified personnel to participate by telephone in such treatment, which individual has been previously provided with ready access to (1) at least one injector suitable for self-administration under the disconcerting circumstances present during the aforesaid time containing a liquid dosage of a medicament injectable into the tissue of the individual effecting the self-administration of the injector, which medicament (a) when so injected is generally effective to reduce the incidence of adverse cardiac conditions, such as ectopic beats, when the existing heart beat condition is within a predetermined portion of the total range of heart beat conditions which may exist during an attack, and (b) may be inadvisable or unwise to inject when such heart beat conditions are outside the predetermined portion of the total range in which the medicament is effective as aforesaid, and (2) a diagnosing device having sensing means operable to be simply and conveniently disposed in operative relation to an individual for sensing a phenomena indicative of the individual's heart beat condition and battery operated signal producing means operable, when said sensing means is disposed in said operative relation to produce signals indicative of the sensed heart beat conditions of the individual, including a signal corresponding with each successive heart beat of the individual capable of being transmitted by telephone, said method comprising the steps of:

1. obtaining access to the aforesaid accessible device and injector by said individual;
2. manually establishing by said individual an operative relation between said individual and the sensing means;
3. sensing through the operation of the sensing means while in said operative relation a phenomena indicative of the existing heart beat conditions of the individual;
4. producing through the operation of said battery operated signal producing means signals indicative of the existing heart beat conditions of said individual including a signal corresponding with each successive heart beat of said individual capable of being transmitted by telephone;
5. utilizing at least some of the signals produced as aforesaid as a basis for determining that the injector obtained by said individual contains medicament which is effective as aforesaid;
6. visually identifying by said individual the injector containing the effective medicament, and
7. self-administering by said individual the identified injector containing the effective medicament and injecting said effective medicament into the tissue of said individual so that said injected medicament will reduce the the incidence of adverse cardiac conditions, such as ectopic beats, in said individual prior to the arrival of said individual at a hospital.

3,870,036

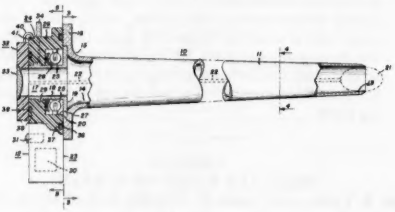
IMPROVED SPECULUM BARREL MEMBER

John M. Fiore, Troy, N.Y., assignor to Bio-Analytical Laboratories, Inc., Troy, N.Y.

Continuation of Ser. No. 249,110, May 1, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,027

Int. Cl. A61b *1/06*

U.S. Cl. 128—6 **10 Claims**



1. A single use disposable barrel member for use with a proctoscopic device having a light source therein comprising in combination

a. a cylindrical cross-section tapered barrel,

b. said tapered barrel having a smaller diameter opening at its distal end than at its proximal end,

c. a sleeve means in the proximal end of said barrel and extending out of said proximal end,

d. said sleeve means having a flange section at one end thereof defining a radially inwardly projecting annular window wall between the proximal end of said barrel and said sleeve means,

e. said annular window wall being positioned in said proximal end of said barrel so that the light source of said proctoscopic device is positioned behind said annular window wall to pass light through said annular window wall and directly into the bore of said barrel,

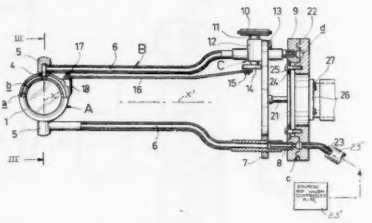
f. an obturator assembly in said barrel comprising a tip portion fitting smoothly in said distal end and a stem means attached to said tip portion and extending through said sleeve means,

g. said sleeve means being of sufficient size to pass said obturator therethrough and out of said barrel member.

3,870,037
APPARATUS FOR OBSERVATIONS, PHOTOGRAPHS AND INTERVENTIONS IN THE POST-RHINAL-PHARYNGEAL REGIONS

Emil E. Cadariu, and Alexandru A. Macovei, both of Bucharest, Romania, assignors to Spitalul Coltea, Bucharest, Romania

Filed July 30, 1973, Ser. No. 383,494
Int. Cl. A61b *1/24*
U.S. Cl. 128—10 **6 Claims**



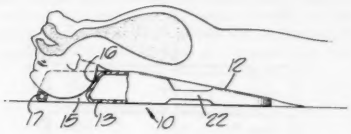
1. An endoscope system comprising:
a stationary support;
a tubular housing defining an optic axis and having a narrow end distal from said support and a broad end adjacent said support;
a mirror assembly pivotal about a mirror axis transverse to said optic axis and including a planar mirror having a reflective face, a frame surrounding said mirror and formed with an annular chamber and a plurality of orifices extending from said chamber and opening toward said face of said mirror, and at least one hollow pivot gudgeon journaled in said narrow end of said housing on said mirror axis and having a hollow interior communicating with said chamber, said housing including a pair of hollow arms each having one end carrying a respective gudgeon, and each having another end attached to said means for rotation of said housing and said assembly about said optic axis, said means for feeding air being connected to said other ends of said arms;
means for feeding air through said gudgeon into said chamber and thence through said orifices over said face of said mirror for demisting same;
means on said support for rotation of said housing and said mirror assembly about said optic axis;
means on said broad end of said housing including a link extending to said mirror assembly for pivoting said assembly about said mirror axis; and
means on said support including a mounting plate adapted to carry an observation apparatus for displacing said plate along said optic axis.

3,870,038
ONE-PIECE SEAMLESS HOLLOW RESUSCITATION PLAQUE

Dennis Arblaster, 34081 La Serena, Dana Point, Calif. 92629

Filed Mar. 15, 1974, Ser. No. 451,460
Int. Cl. A61h *31/00*
U.S. Cl. 128—28 **9 Claims**

1. A one-piece resuscitation plaque for use in treating a patient suffering from suffocation, shock, cardiac conditions and the like, said plaque comprising a rigid seamless hollow buoyant shell of high-strength, rotationally molded thermoplastic material having a substantially uniform wall thickness, said plaque being elongated and tapering to a substantially thinner thickness at the forward end thereof, said plaque being relatively thick at the rear end and sized to underlie and firmly support the head and back of a spine patient, the rear end of said plaque having a head-supporting recess with a continuous head-supporting perimeter shaped to support the patient's head firmly while tilted rearwardly and downwardly and with the chest supported rigidly elevated whereby the bronchial

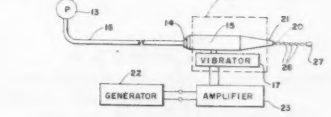


passages of a supine patient lie open in a generally straight path to provide free unobstructed access through the mouth and into the lungs of the patient.

3,870,039
FRACTIONATED LIQUID JET

Michel Antoine Cesar Moret, and Pierre Jean Jousson, both of Geneva, Switzerland, assignors to Les Produits Associes, LPA SA, Geneve, Switzerland

Filed Jan. 18, 1973, Ser. No. 324,667
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **25 Claims**



1. An apparatus for body care comprising means for storing a liquid, nozzle means for projecting the liquid at an ejection velocity within a predetermined range to a selected area, said nozzle means including a nozzle having an opening having a diameter in the range of about 0.2 to about 1.1 mm, means for supplying the liquid under pressure from said storing means to said nozzle means, and means for fractionating the liquid at a frequency in the range of about 200 to about 5,000 cps into a plurality of unitary, discrete liquid droplets for successively impacting said selected area with said plurality of unitary, discrete liquid droplets, wherein said droplets are further characterized in that each of said droplets successively percusses said selected area at an impact rate substantially equal to the number of droplets produced by said fractionating means per unit of time, said droplets having a diameter when formed which is larger than the diameter of the opening in the nozzle.

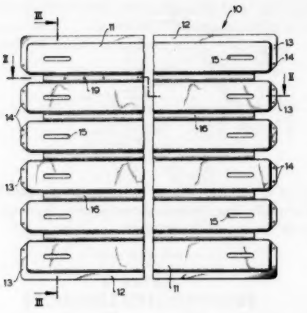
3,870,040
BUBBLE MAT FOR BATH TUBS

Ruth Kulisch geb. Klages, Schwalbenstr. 7, 2902 Rastede, Germany

Filed Aug. 7, 1973, Ser. No. 386,479
Claims priority, application Germany, Nov. 25, 1972, 2257935
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **16 Claims**

8. A bubble mat for use in a bathtub and the like and adapted for connection to an air pump comprising:
a plurality of longitudinal spaced-apart bars defining a planar support surface for the mat;
a plurality of hollow pipe sections, each secured between each of said bars and having a plurality of bubble openings disposed along their length, said pipe sections being

recessed below the planar support surface of said bars; and a single articulated joint having a flexible hinge portion, for joining said bars to the adjacent bars of a further mat.



3,870,041

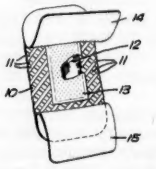
SURGICAL DRESSINGS

Graham Leighton Davies, London, England, assignor to BTR Industries Limited, London, England

Filed Aug. 16, 1973, Ser. No. 388,779

Int. Cl. A61f *13/02*

U.S. Cl. 128—156 **14 Claims**



1. An improved surgical or wound dressing of the kind comprising a backing strip one side of which has an adhesive facing, a resilient absorbent pad on said one side of the backing strip, and a means for contacting and conforming to the wound surface comprising a covering layer overlying the absorbent pad of a readily stretchable film of elastomeric material which has a thickness not greater than **0.010** inch and a means for permitting wound scab and exudate from a wound to which the dressing is applied to be readily passed there through comprising deformable spaced perforations in said elastomeric covering material layer.

3,870,042

APPARATUS FOR SEPARATING AND INJECTING BLOOD COMPONENT

Leon Fernand Viguier, Saint-Pierre de Mesage, France, assignor to Laboratories Medicoplast, Paris (Seine), France

Filed Oct. 6, 1972, Ser. No. 295,687

Claims priority, application France, Oct. 13, 1971, 71.36734

Int. Cl. A61m-*5/00*

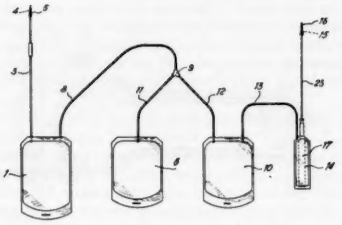
U.S. Cl. 128—214 D **5 Claims**

1. In an apparatus for sampling and fractionating blood components including a plurality of sampling and fractionating pockets interconnected by tubing, a means for sequentially isolating, storing and intravenously injecting into a patient a blood component present in small amounts in the blood and liable to contain agglomerated elements, said means comprising:

a distinct storage pocket for said component,

the inlet of said storage pocket being connected by sectionable tubing to said plurality of sampling and fractionating pockets,

the outlet of said storage pocket being sealed and having means for being equipped with injection means;



a filter means for preventing the injection of the agglomerated elements incorporated inside said storage pocket between said inlet and said outlet; said storage pocket being of dimensions substantially corresponding to the quantity of the component separated.

3,870,043

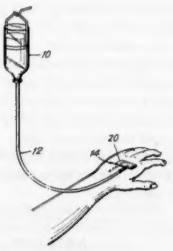
U-SHAPED INTRAVENOUS NEEDLE STRUCTURE

Allan R. Dunn, 1160 Kane Concourse, Bay Harbor Islands, Miami Beach, Fla. 33154

Filed Mar. 28, 1974, Ser. No. 455,546

Int. Cl. A61m *05/14, 05/32*

U.S. Cl. 128—214 R **8 Claims**



1. A U-shaped intravenous needle structure comprising:

a rigid, hollow, needle designed and adapted for performing a venipuncture in a patient's extremity;

a hollow, curved, rigid tube member having an opening at each end of the curve, one end of the curve being in fluid connection with and firmly secured to the needle; and

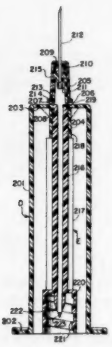
connecting means designed and adapted to be connected to a source of intravenous fluid, the connection means being in fluid flow connection with and firmly secured to the second end of the curve;

the center lines of the needle and the connecting means being in substantially the same plane and at an angle to each other of from about 150° to about 180°.

3,870,044
HYPODERMIC SYRINGE BODY STRUCTURE

George K. Burke, and Kenneth Raines, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Division of Ser. No. 171,624, Aug. 13, 1971, Pat. No. 3,768,474. This application June 19, 1973, Ser. No. 372,053
Int. Cl. A61m 5/24
U.S. Cl. 128—220 10 Claims



1. A hypodermic syringe body structure for association with a liquid medicament container of the type including a pierceable stopper having a connector thereon, said body structure comprising a molded plastic barrel member having an open end, a base opposite said open end having an aperture therethrough and an integral guide sleeve surrounding the aperture in the base and extending axially inwardly of said base a distance that is relatively short in relation to the axial extent of said barrel member, a one-piece molded plastic inner tubular member having a hollow interior and at least a portion thereof fitting within said guide sleeve and an end portion having a connector for coupling engagement with a stopper of such a medicament container, said end portion terminating at least approximately in the plane of the open end of said barrel and comprising an enlarged, internally threaded, integrally formed plastic portion of said inner tubular member, a hollow, plastic, stopper piercing spike coaxially disposed within said enlarged internally threaded portion integrally formed of the plastic of the tubular member and in fluid communication with the hollow interior of the inner tubular member, one of said barrel member and inner tubular member having an integral tubular extension projecting outwardly of the aperture in said base, said tubular extension being in fluid communication with the hollow interior of the inner tubular member, said tubular extension having a frangible portion outwards of said base of said barrel member, means operatively connected with said tubular extension outwards of said frangible portion for receiving an end portion of a cannula, said barrel member and inner tubular member having mutual facing bonding surfaces, and means effectively bonding said barrel member and tubular member together.

3,870,045
MULTIPURPOSE HYGIENIC KIT

Curtis M. Vaughan, 1925 Jackson, Joplin, Mo. 64801

Continuation-in-part of Ser. No. 160,771, July 8, 1971, abandoned. This application June 28, 1973, Ser. No. 374,694
Int. Cl. A61m 3/00
U.S. Cl. 128—229 3 Claims

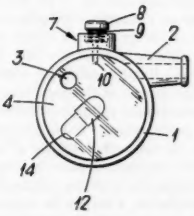
1. A medicated douche comprising:
an elongated, tubular, perforated probe adapted for insertion into a body cavity,
said probe having an inlet orifice at one end thereof and one or more outlet apertures at the opposite end thereof;
a hollow receptacle ahead of said probe adjacent said inlet and having a compartment for receiving a medicinal suppository,
said compartment having an entry spaced from said inlet and an exit adjacent the inlet whereby a fluid forced through the compartment and into the probe may carry medication therewith from said suppository; and

structure for introducing the suppository into said compartment, said structure including an insertion tube coupled at one end thereof with said entry and adapted to freely receive the suppository, and a plunger received and shiftable within said tube toward said one end thereof for extruding the suppository into said compartment through said entry.

3,870,046
INSUFFLATOR

Roderick Douglas Elliott, Burnham, England, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 22, 1974, Ser. No. 462,805
Claims priority, application Great Britain, May 8, 1973, 21991/73
Int. Cl. A61m 13/00
U.S. Cl. 128—266 14 Claims

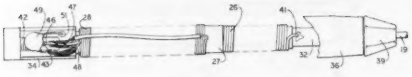


1. An inhalation device comprising a housing having a first chamber portion and a medicament chamber portion therewithin and having a single mouthpiece formed with passage means communicating respectively with said chamber portions; said housing being provided with an air exhaust port communicating with said first chamber portion and an air inlet port communicating with said medicament chamber portion; a rotor mounted within said housing; a drive portion on said rotor driven by said air flow through said first chamber portion; means for dispersing a medicament within said medicament chamber portion and air flow means for causing air flow through said first chamber portion and said exhaust port by exhalation through said mouthpiece to effect rotor movement and for causing air flow through said inlet port and said medicament chamber portion to effect entrainment of said medicament by inhalation through said mouthpiece.

3,870,047
ELECTROSURGICAL DEVICE

Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research and Development Corporation, Milford, Del.

Filed Nov. 12, 1973, Ser. No. 414,646
Int. Cl. A61b 17/36; A61n 3/02
U.S. Cl. 128—303.14 6 Claims

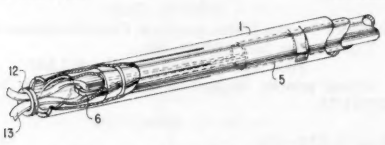


6. In an electrosurgical device, the combination of a coaxial cable having a central lead and an outer conductor and means for generating a radio-frequency current of an electrosurgical frequency in the central lead of the coaxial cable, with a handpiece which comprises a first coil, a second coil inductively coupled to the first coil, an electrode, means for connecting one end of the first coil to the electrode, means for connecting one end of the second coil to the central lead, and a condenser, the other end of the second coil being coupled to the outer conductor through the condenser, the second coil powering the first coil and the electrode, the outer conductor preventing radio-frequency leakage between the generating means and the handpiece.

3,870,048
DEVICE FOR STERILIZING THE HUMAN FEMALE OR MALE BY LIGATION

In Bae Yoon, 9508 Falls Bridge Ln., Potomac, Md. 20854

Filed July 30, 1973, Ser. No. 383,475
Int. Cl. A61b 17/12
U.S. Cl. 128—326 18 Claims



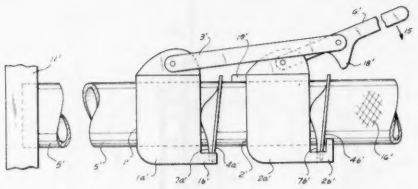
1. A ring applicator device used for applying an elastic occluding ring to an anatomical tubular structure which comprises an inner cylinder and an outer cylinder, said inner cylinder being slidably disposed within said outer cylinder, and forceps means slidably disposed within said inner cylinder, said forceps means including means for grasping and releasing said anatomical tubular structure, the proximal end portion of said inner cylinder having means thereon to selectively retain on its outer end surface at least two elastic occluding rings and said outer cyinder having an expandable end portion which cooperats with the proximal end portion of the inner cylinder to define a means for sequentially ejecting the elastic occluding rings from the inner cylinder after axially displacing the outer and inner cylinders relativc to each other to position said expandable end portion behind a ring.

3,870,049
OBSTETRIC DEVICE FOR ANIMALS

Werner Weiland, Bendorf-Sayn, Germany, assignor to Rheintechnik Weiland & Kaspar OHG, Bendorf, Germany

Division of Ser. No. 375,848, July 2, 1973,. This application June 27, 1974, Ser. No. 483,669
Claims priority, application Germany, July 4, 1972, 2232713
Int. Cl. A61d 1/08; A61b 17/42
U.S. Cl. 128—353 11 Claims

1. An obstetric device for use with animals, particularly cattle and the like, comprising an elongated member having a knurled other circumferential surface and further having an end adapted to abut an animal giving birth; a means for selectively grasping and releasing said elongated member including at least two members individually shiftably mounted on said elongated member and each adapted to be connected with an animal being born; contro means for effecting individual movement of said shiftable members in a direction away from said end so that a tension may be continuously exerted on the animal being born when said shiftable members are connected

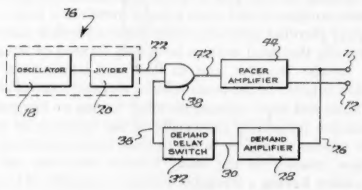


with the latter to thereby aid the birth process; holding means for preventing movement of said shiftable members in a direction towards said end; and releasing means mounted on at least one of said shiftable members for substantially simultaneously releasing both said shiftable members for movement in a direction towards said end in response to operation of said releasing means so that in case of emergency the tension exerted on the animal being born may be quickly released.

3,870,050
DEMAND PACER

Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031

Filed Nov. 7, 1973, Ser. No. 413,451
Int. Cl. A61n 1/36
U.S. Cl. 128—419 PG 10 Claims

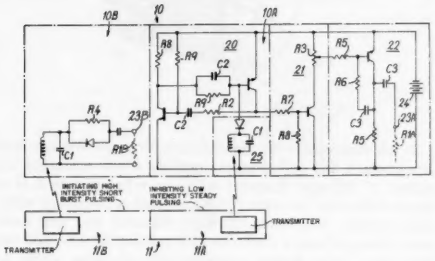


7. A cardiac pacer comprising:
a. electrode means adapted to be operatively connected to a patient's heart;
b. a source of electrical pulses having a constant frequency; and
c. control means connected to said electrode means and to said source for connecting said source to said electrode means in the absence of a natural heart signal and for temporarily disconnecting said source from said electrode means in response to the occurrence of a natural heart signal and thereafter reconnecting said source to said electrode means, said control means maintaining the periodicity of said source such that the pulse interval of stimulating pulses provided by said pacer is fixed to the constant frequency of said source.

3,870,051
URINARY CONTROL

Giles Skey Brindley, London, England, assignor to National Research Development Corporation, London, England

Filed Apr. 26, 1973, Ser. No. 354,910
Claims priority, application Great Britain, Apr. 27, 1972, 19583/72
Int. Cl. A61n 1/36
U.S. Cl. 128—422 12 Claims

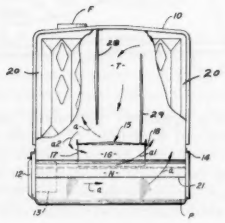


1. A method of urinary control which comprises applying an electrical signal of continuous pulse train form to the sacral ventral roots, said sacral ventral roots communicating with the sphincter muscle and bladder muscle, thereby causing the step of contracting said sphincter muscle while said bladder muscle is relaxed.

3,870,052
OIL-FIRED RADIANT SPACE HEATER

Malcolm W. Patrick, Danville, and Joseph W. Adams, Westlake, both of Ohio, assignors to Bettcher Manufacturing Corporation, Cleveland, Ohio

Filed Apr. 5, 1973, Ser. No. 348,310
Int. Cl. F24c 1/10
U.S. Cl. 126—91 R 11 Claims



7. A radiant space heater having radiant convoluted widely-spaced side walls, relatively staggered baffle means for guiding a main tortuous stream of hot gases between said side walls, said baffle means standing normal to said side walls with edges adjacent but detached therefrom and permitting hot gases to flow in thin short-cut streams around said edges and into heat-scrubbing contact with the convolutions of the side walls, said short-cut stream augmenting the flow of gases in said main stream.

3,870,053
ENHANCEMENT OF FLAVOR AND AROMA BY MICROWAVE TREATMENT

Norman D. Heitkamp, Jeffersonville, Ind.; Steven L. Merker, and George E. Stungis, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 6, 1972, Ser. No. 260,160
Int. Cl. A24b 03/12, 15/04
U.S. Cl. 131—121 3 Claims

1. A process for enhancing the flavor and aroma characteristics of botanical materials comprising:

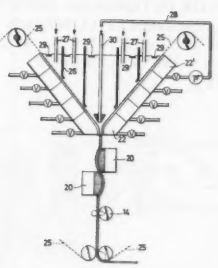
a. treating said botanical materials with a combination of water and an inert nontoxic, volatile, organic solvent in which the flavor and aroma generating materials are soluble to obtain a moisture level of from 5 to 75%; and

b. subjecting the botanical material to microwave energy at a frequency of at least 915 mc and a power level of from 0.05 to 0.25 kilowatt per pound of contained water for a period of time and at a distance such that said solvent is substantially volatilized and the flavor and aroma of said botanical material are improved without substantially expanding said material.

3,870,054
METHOD OF MAKING A LAMINATED TOBACCO FOIL

Hanns F. Arledter, Graz, and Josef Marek, Vienna, both of Austria, assignors to Austria Tabakwerke Aktiengesellschaft vorm., Osterreichische Tabakregie, Vienna Porzellangasse, Austria

Filed May 18, 1973, Ser. No. 361,594
Claims priority, application Austria, May 19, 1972, 4367/72
Int. Cl. A24b 3/14, 13/00
U.S. Cl. 131—140 C 22 Claims



1. A method of making reconstituted tobacco foil comprising at least two separate films containing principally tobacco particles which comprises:

providing an aqueous suspension of tobacco particles by swelling comminuted tobacco particles or fibers, subsequently grinding same and finally diluting same with water to form an aqueous suspension containing about 0.2 to 0.4 percent insoluble solids,

forming two separate wet sheets of tobacco particles by precipitating tobacco particles from said aqueous suspension onto foraminous webs,

combining together the resulting two wet sheets in proximate face to face relationship,

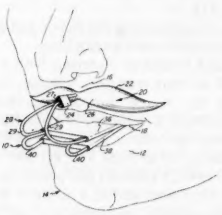
dehydrating the combined sheets by pressing, and

thermally drying the combined pressed sheets.

3,870,055
MUSTACHE STYLING DEVICE

Charles E. Barbarow, 156 Barclay St., Paterson, N.J. 07503

Filed May 21, 1974, Ser. No. 472,000
Int. Cl. A45d 2/50
U.S. Cl. 132—10 10 Claims



1. A device for providing an outline pattern for styling a person's mustache, said device comprising:

a template for providing a prescribed mustache outline pattern, said template having an obverse surface and a reverse surface;

clamping means receivable within the mouth; and

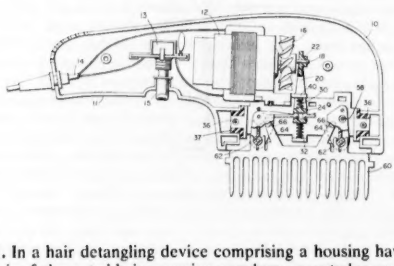
means for attaching the template to the clamping means, said attaching means locating the template such that the reverse surface will be juxtaposed with the person's upper lip when the clamping means are held within the mouth of the person;

said clamping means including placement means responsive to clamping pressure of the mouth on the clamping means to urge the template toward the upper lip.

3,870,056
HAIR DETANGLING DEVICE

Walter Stemme, Staufenstrasse 23, Sulzbach/Ts, Germany

Filed Nov. 7, 1973, Ser. No. 413,499
Int. Cl. A45d 24/00
U.S. Cl. 132—11 A 4 Claims

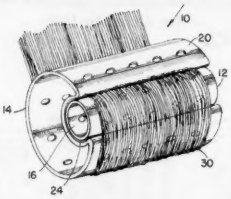


1. In a hair detangling device comprising a housing having a pair of elongated hair engaging members mounted generally parallel side by side for reciprocating movement in the direction of their length, the improvement which comprises a first bell crank pivotally mounted with respect to the housing having a first end removably connected to one said member, a second bell crank pivotally mounted with respect to the housing spaced from the first said bell crank and having a first end connected to the other said member, a driving member engaging the second ends of both bell cranks, means for reciprocating said driving member to rock said bell cranks simultaneously about their pivots so that their first ends move successively toward and away from the zone between them to reciprocate said combs oppositely with respect to each other and a spring mounted between said housing and said driving member resiliently opposing reciprocatory movement of said driving member in both directions.

3,870,057
HAIR ROLLER

Carmine Pezzino, 251 Westminster Rd., Brooklyn, N.Y. 11226

Filed Nov. 23, 1973, Ser. No. 418,425
Int. Cl. A45d 2/02
U.S. Cl. 132—39 1 Claim

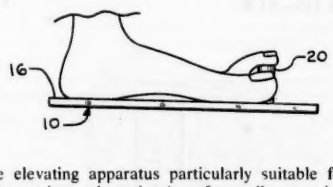


1. An improved roller combination for rendering hair both straightened and curled simultaneously which comprises two rollers of different diameter with one roller provided as an inside roller and the other roller provided as an outside roller, said outside roller being of major diameter and said inside roller being of minor diameter with respect thereto, said outside roller being further provided with receiving means for removably receiving said inside roller so that hair may be alternately rolled around said inside and outside rollers, respectively, said inside and outside rollers further comprising vented annular bodies, said receiving means further comprising an elongated, longitudinal, partially circular channel provided in said outside roller into which said inside roller is removably forceably fittable, the diameter of said partially circular channel being slightly smaller than the diameter of said annual body comprising said inside roller.

3,870,058
TOE ELEVATING APPARATUS

Henry H. Merriman, 751 W. Washington, Jackson, Mich. 49203

Filed Nov. 9, 1973, Ser. No. 414,504
Int. Cl. A45d 29/00
U.S. Cl. 132—73 6 Claims



1. Toe elevating apparatus particularly suitable for use during the cutting and manicuring of toenails comprising, in combination, a foot support having a surface upon which the foot may be supported, and a toe elevating pedestal mounted upon said foot support extending from said surface, said pedestal being of a width sufficient to support only a single toe at a time.

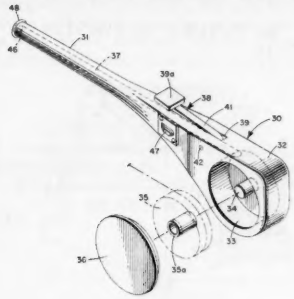
3,870,059
DENTAL FLOSS DISPENSER

William E. Bennington, 5 Fillmore Dr., Sarasota, Fla. 33578

Continuation-in-part of Ser. No. 215,532, Jan. 5, 1972, and Ser. No. 54,254, July 13, 1970,. This application Mar. 22, 1974, Ser. No. 453,972
Int. Cl. A61c 5/00
U.S. Cl. 132—92 A 1 Claim

1. A dental floss dispenser adapted to dispense a desired amount of dental floss comprising in combination, a finger section communicating with a spool section, a freely turnable spool of dental floss in said spool section and retaining cap

means for retaining said spool in said spool section, a bore hole extending through said finger section and extending directly into said spool section through which said floss is threaded, longitudinal slit means in the top of said dispenser communicating with said bore hole, manually operable brake means disposed within said slit means adapted to frictionally engage said floss during use, said brake means comprising an elongated member, one end which is pivotally connected



within said slit means, whereby said brake means are manually pivotable within said slit means, a head member at the opposite end of said brake means, said head member comprising an upper flat head portion integral with a downward projection adapted to be depressed within said slit means to frictionally engage an underportion thereof with said floss in said bore hole, whereby when said brake means are manually released a desired amount of floss can be freely pulled from the end of said finger section.

3,870,060

METHOD OF REMOVING MONOVALENT INORGANIC ACIDS FROM AN AQUEOUS SOLUTION CONTAINING METAL SALTS OF THE ACIDS

Jan-Olov Liljenzin, Kallered; Hans Reinhardt, and Helge Jan Arnold Rydberg, both of V. Frolunda, all of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Feb. 26, 1974, Ser. No. 336,007
Int. Cl. C23g *1/36*
U.S. Cl. 134—3 **13 Claims**

1. A method of removing monovalent inorganic acids from an aqueous solution containing metal salts of said monovalent inorganic acids said monovalent acids being nitric, hydrochloric, or hydrofluoric acid, said method comprising of adding to said aqueous solution sulphuric acid at least equivalent in amount to the metal ion content of the solution, extracting said monovalent inorganic acids by bringing the solution into contact with an organic liquid phase, said organic liquid phase including compounds forming adducts with said monovalent acids, and separating said organic liquid phase from said aqueous solution.

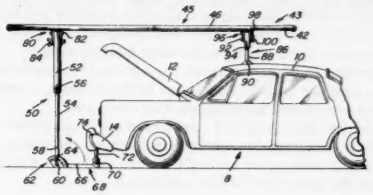
3,870,061

AUTOMOBILE MOUNTED SHELTER

James I. Lowery, 208 Judy St., Houston, Miss. 38851

Filed Apr. 3, 1973, Ser. No. 347,484
Int. Cl. E04f *10/00*
U.S. Cl. 135—5 A **10 Claims**

1. In combination, an automobile having a rigid roof-equipped body and a front bumper, attachable and detachable shelter means designed and adapted to shield and protect a user, a working mechanic for example, from sunny, rainy and inclement weather conditions, said means comprising a substantially horizontal roof spanning frame structure, flexible weather-proof cover means spread over, protectively covering and operatively attached to oriented portions of said frame structure, a forward vertically disposed main supporting post having an upper end retentively connected to a forward marginal portion of said frame structure, floor surface contacting means connected to the lower end of said post and embodying a rearwardly directed surface contacting bracket means provided at its rear end portion with an upwardly projecting portion operatively connected at its upper end portion to a



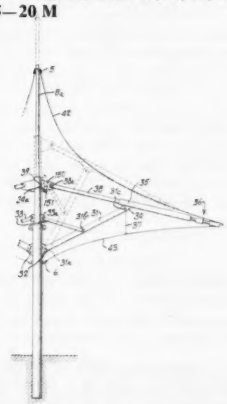
predetermined portion of said bumper, an auxiliary vertically disposed supporting post carried by a rearward portion of said frame structure and having a lower end retentively perched atop a suitable surface portion of said roof, said bracket means being of an effective horizontal length that it functions to locate and space said main supporting post forwardly of the bumper in a manner that the mechanic at work is afforded ample space and room to work on the front engine-equipped end of the automobile for whatever purposes required.

3,870,062

ILLUMINATED PAVILION UMBRELLA

Richard Larry Medlin, 8802 N. Myrtle Pl., Tucson, Ariz. 85704

Filed Apr. 22, 1974, Ser. No. 463,066
Int. Cl. A45b *19/04, 19/06*
U.S. Cl. 135—20 M **9 Claims**



1. A roofing umbrella apparatus comprising:
an upper membrane having an inner edge and an outer edge;
a lower membrane having an inner edge and an outer edge;
a mast means for supporting said upper and lower membranes and including:
a lower base member having an elongated chamber therein;
an upper member riding within said chamber in said lower base member and extendable upward therefrom;
means on said lower base member for holding the inner edge of said lower membrane;

means on said upper member for holding the inner edge of said upper membrane;

a plurality of means for holding the outer edges of said upper and lower membranes adjacent to one another and each having an elongated chamber therein;

a plurality of lower supporting arms, each pivotably connected at its opposite ends to said lower base member and to a respective one of said outer edge holding means;

a plurality of upper supporting arms, each pivotably connected at its inner end to said upper member and having its outer end riding within the elongated chamber in a respective one of said outer edge holding means;

a plurality of brace members, each pivotably connected at its opposite ends to said upper member and to a respective one of said lower supporting arms; and

means for extending said upper member from within said lower base member whereby said upper and lower supporting arms pivot inwardly toward said mast means to furl the upper and lower membranes.

3,870,063

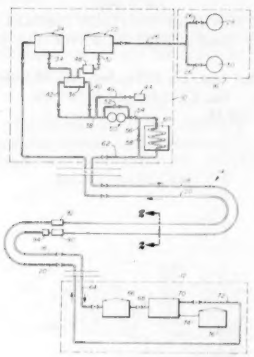
MEANS OF TRANSPORTING CRUDE OIL THROUGH A PIPELINE

John T. Hayward, 122 Bayside Dr., Clearwater, Fla. 33515

Filed June 11, 1971, Ser. No. 152,196

Int. Cl. F17d *1/16*

U.S. Cl. 137—13 **4 Claims**



1. A method of transporting crude oil through a pipeline from a transmission station, such as a crude oil producing area, to a receiving station, such as a refinery, wherein an adverse pipeline environment normally prevents economic pumping because of a high viscosity of the crude oil, which comprises:

pumping a light petroleum distillate from the receiving station to the transmission station through a first pipeline traversing the adverse environment;

intimately mixing the light petroleum distillate with crude oil at the transmission station in an amount sufficient to produce a blended petroleum having a viscosity suitably low for preserving pumpability of the blended petroleum at conditions of the adverse environment; and

pumping the blended petroleum from the transmission station to the receiving station through a second pipeline in a direction countercurrent to the light petroleum distillate.

3,870,064

METHOD FOR MAKING A BRANCH CONNECTION UNDER PRESSURE TO A PIPE AND A SCREWTHREADED BRANCH CONNECTION FOR CARRYING OUT SAID METHOD

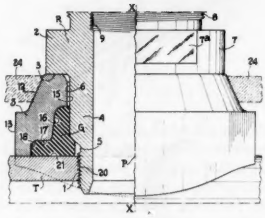
Pierre Vigneron, Nancy, France, assignor to Pont-A-Mousson S. A., Pont-A-Mousson, France

Filed Mar. 2, 1973, Ser. No. 337,501

Claims priority, application France, Mar. 31, 1972, 72.11645

Int. Cl. B23b *41/08*; **F16e** *41/04*

U.S. Cl. 137—15 **8 Claims**



1. A method for making a branch connection of a connector to a pipe under pressure, the connector having a body, a screwthreaded portion and means defining a member projecting radially from the body, comprising applying a sealing device to the pipe in a region of the pipe in which the branch connection is to be made, taking means defining a fluidtight enclosure having a portion defining an aperture, applying the periphery of the aperture against the sealing device, drilling and tapping a hole in the pipe and thereafter screwing the screwthreaded portion of the connector in the tapped hole from inside the enclosure until said projecting member bears against the sealing device.

3,870,065

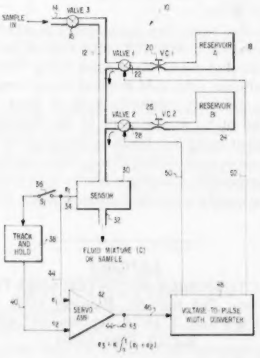
MEASURING SYSTEM

H. Gordon Minns, Jr., Rt. 11, P.O. Box 91B, Morgantown, W. Va. 26505

Filed Aug. 6, 1973, Ser. No. 385,642

Int. Cl. G05d *11/13*

U.S. Cl. 137—93 **17 Claims**



1. A system for mixing fluids comprising a sensor for producing an electrical output indicative of a component concentration in a fluid, means coupled to said sensor for supplying a sample fluid to it having a concentration of said component

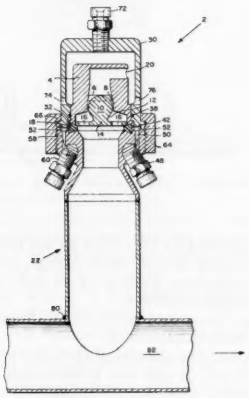
whereby said sensor produces a first electrical output, electrical storage means coupled to said sensor for storing said first output, a pair of fluid reservoirs coupled to said sensor, at least one of said reservoirs being adapted to contain a fluid having a known concentration of said component, proportioning means coupling said reservoirs to said sensor, said sensor producing a second electrical output indicative of the concentration of said component from said reservoirs, and a servo amplifier coupling said sensor and said storage means to said proportioning means for controlling said proportioning means in accordance with said first and second electrical outputs to produce a fluid mixture from said reservoirs having the same concentration of said component as the sample fluid.

3,870,066

ASEPTIC VACUUM BREAKER

Walter R. Jurasek, Gustine, Calif., assignor to Avoset Food Corporation, Oakland, Calif.

Filed Nov. 21, 1973, Ser. No. 417,980
Int. Cl. F16r *45/02*
U.S. Cl. 137—199 **6 Claims**



6. An aseptic vacuum breaker comprising:
a hollow valve body having an internal valve seat,
a valve plug urged away from said seat by gravity,
means to limit the movement of said valve plug away from said seat to a predetermined distance,
said valve body having a lower opening below the valve seat and an upper opening above the valve seat,
an adapter conduit removably joined to the lower end of the valve body and communicating with the interior of the valve body,
a cover overlying the valve body, removably joined to the lower end of the valve body, and spaced from the upper opening of the valve body,
means to blanket the joint between the adapter conduit and the cover with an aseptic fluid, and
means including a conduit communicating with the interior of the cover to supply aseptic air to the interior of the cover.

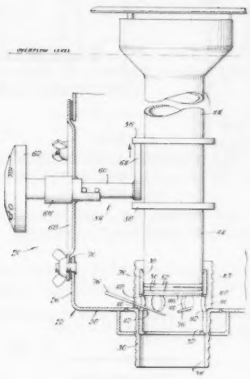
3,870,067

DISH WASHING MACHINE DRAIN UNIT

Casimer Janiszewski, Chicago, Ill., assignor to G. S. Blakeslee Co., Chicago, Ill.

Filed Nov. 19, 1973, Ser. No. 417,184
Int. Cl. E03c *1/232*; **F16k** *25/00*, *31/524*
U.S. Cl. 137—242 **4 Claims**

1. A drain unit comprising a housing having side walls and a bottom wall, a drain opening provided in said bottom wall, a vertical sleeve member secured at its lower end in said drain opening and presenting an interior cylindrical surface, said sleeve member having at least one drain port in the side thereof with said drain port presenting a sharp lower inner edge, a vertical tubular stand pipe extending downwardly into said sleeve member and having a bottom end, seal means carried by said stand pipe adjacent said bottom end thereof and having sealing engagement with said interior cylindrical surface of said sleeve member, said stand pipe being vertically movable between a first position wherein said bottom end



thereof and said seal means are disposed below said drain port for closing the latter and a second position wherein said bottom end thereof and said seal means are substantially disposed above said drain port for opening the latter, and said bottom end of said stand pipe presenting a sharp outer circumferential edge which upon movement of said stand pipe from said second position to said first position cooperates with said drain port edge in breaking up solid foreign materials extending through said drain port whereby to prevent such solid foreign materials from affecting said seal means.

3,870,068

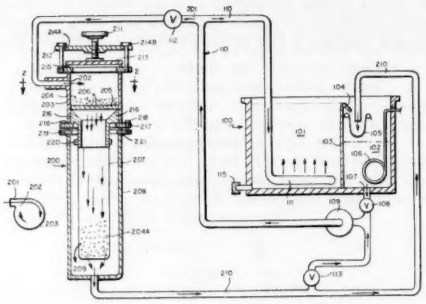
APPARATUS FOR DRY REPLENISHMENT OF ELECTROLESS PLATING SOLUTIONS

Oleh Borys Dutkewych, Medfield, Mass., and Lebert Arthur Hofmann, Westminster, Calif., assignors to Shipley Company, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 188,243, Oct. 12, 1971, Pat. No. 3,770,464. This application Dec. 7, 1972, Ser. No. 313,178
Int. Cl. C23c *3/02*
U.S. Cl. 137—268 **15 Claims**

1. An apparatus for replenishing a metal plating solution with replenishers in essentially dry form to thereby avoid volume growth of the plating solution and to avoid the introduction of essentially dry replenisher directly into a tank holding said plating solution, said apparatus comprising a first chamber positioned above a second chamber, said first chamber having inlet means for entry of plating solution and means for supporting said essentially dry replenisher in said chamber, said second chamber having outlet means for exit of plating solution and a porous container placed therein such that the plating solution must pass through said porous container before exiting from said second chamber, said supporting means being adapted to permit particles of replenisher which have

been wetted by said plating solution to pass through said first chamber and to rain down into said porous container in said



second chamber, and said first and second chambers being in pressure seal relationship.

3,870,069

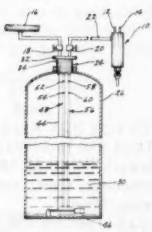
METHOD AND MEANS OF APPLYING ADDITIVES TO INDUSTRIAL GAS

Berwyne E. Etter, 10355 Paradise Blvd., Treasure Island, Fla. 33740

Continuation of Ser. No. 295,133, Oct. 5, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,800

Int. Cl. F04f *1/18*

U.S. Cl. 137—209 **4 Claims**



1. In combination,

a container having an open upper end,

an industrial gas additive in said container,

a fitting closing said open upper end and having a chamber formed therein,

a torch means,

a first conduit means in communication with said chamber and extending to said torch means,

a second conduit means in communication with the upper interior of said container and in communication with a fuel gas supply,

a first dip tube means having an open upper end in communication with said chamber and extending downwardly into said container, said first dip tube means having a plurality of vertically spaced openings formed the rein below its upper end in communication with the upper interior of said container,

at least a second dip tube means having its upper end in communication with said chamber and extending downwardly into said container, said second dip tube means having a plurality of vertically spaced openings formed therein below its upper end in communication with the upper interior of said container,

and a normally closed first valve means in said chamber mounted in the upper end of said second dip tube means, said first valve means being opened when the pressure in said second dip tube means sufficiently exceeds the pressure in said chamber.

3,870,070

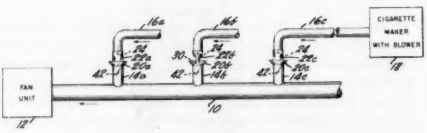
AIR SYSTEM CONTROL

Gerald A. Kraft, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,408

Int. Cl. F16k *15/14*

U.S. Cl. 137—512 **5 Claims**



1. In apparatus for exhausting air and the like from a plurality of operating devices which during operation of the same require continuous removal of air and the like therefrom, which apparatus includes:

a main exhaust duct, and a fan unit for drawing air through said main exhaust duct;

a corresponding plurality of elongated transition ducts each connected at one end to said main exhaust duct and extending a distance therefrom;

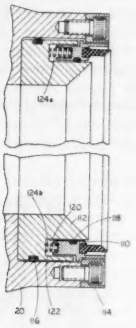
an elongated separate branch exhaust duct associated with each device and connected at one end thereof with the associated device and extending therefrom to flow communicative juncture at its other end with the other end of one of said transition ducts, said other end of each transition duct having a radially outwardly flared encircling skirt enclosing a space of predetermined cross-sectional area defining an opening into which the said other end of an associated separate branch exhaust is received in coaxial disposition with said transition duct, there being embodied in each of said devices air blowing means for delivering air flow from each said device to the associated branch exhaust duct, the improvement in which

the said other end of each separate branch exhaust duct is provided as a flexibly structured sleeve of a material sufficiently flexible to enlarge radially under the influence of air flow delivered from the blowing means of said device through said branch exhaust duct and being dimensioned such that in enlarged condition it occupies only a certain portion of the skirt enclosed cross-sectional area whereby compensating air flow can be drawn by the action of said fan unit into said transition duct around the periphery of said sleeve from the environment external to the associated device and branch exhaust duct, said sleeve further being sufficiently flexible to collapse from its expanded condition in the absence of air flow through said branch exhaust duct to diminish the portion of skirt enclosed cross-sectional area occupied by said sleeve with concomitant increase in the flow of compensating air drawn into said transition duct.

3,870,071
SWING CHECK SEAL ASSEMBLY

Donald E. Graham, San Leandro, and Larry A. Battaglia, Benicia, both of Calif., assignors to Valve Systems International, Inc., Bala Cynwyd, Pa.

Filed Jan. 16, 1974, Ser. No. 433,760
Int. Cl. F16k *15/03*
U.S. Cl. 137—527 **7 Claims**



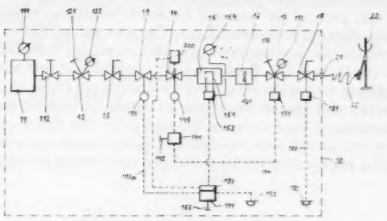
1. In a swing check valve comprising:
a housing having a pair of flow passageways therein;
a valve clapper in said housing;
means pivotally mounting said clapper in said housing adjacent one of said flow passageways;
an annular sealing surface on said clapper;
a seat ring floatingly mounted in said body around said one passageway for limited axial and radial movement therein;
a complementary surface on said seat ring engagable by the sealing surface of said clapper;
a resilient seal ring carried on the leading surface of said seat ring;
means associated with said seat ring for providing yieldable sealing forces between said seal ring and said sealing surface when engaged, said means providing a lesser sealing force at portions of said seat ring adjacent said pivotable mounting and a greater sealing force at portions of the seat ring displaced therefrom; and
retainer means holding said seat ring on said body.

3,870,072
INSUFFLATION APPARATUS FOR INTRODUCING LIMITED QUANTITIES OF CARBON DIOXIDE INTO THE HUMAN BODY FOR OPERATIVE PURPOSES

Hans-Joachim Lindemann, Kleiner Schaferkamp 43, 2000 Hamburg 6, Germany

Filed June 29, 1973, Ser. No. 374,967
Claims priority, application Germany, May 10, 1973, 2323682
Int. Cl. A61b *5/10*
U.S. Cl. 137—557 **1 Claim**

1. Insufflation apparatus for introducing limited quantities of carbon dioxide to the human body for surgical purposes comprising, in combination, a housing, a replaceable carbon dioxide container (**11**), a manometer and a shut-off valve (**19**) for said container, said shut-off valve (**19**) being operable between an open and closed position, flow measuring means (**15**) comprising measured value pickup means (**151**) consisting of PTC conductor feelers, said measured value pickup means (**151**) being constructed as a cold conductor, a warning signal generating device (**192**), a control device (**191**) including a measured value comparator (**152**) and a time switch (**193**) connecting said signal generating device (**192**) to said flow meter (**15**), drive motor means, and means connecting said shut-off valve (**19**) to said flow measuring means (**15**) and to said drive motor means, said drive motor means being

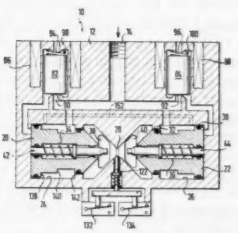


operable to reopen said shut-off valve (**19**) after closure thereof upon passage of a variable regeneration time under control of said time switch (**193**).

3,870,073
VALVE ASSEMBLY FOR CONTROLLING FLUID PRESSURE OPERATED APPARATUS PARTICULARLY PRESSES

Erich Ruchser, Stetten/Wurtt, and Helmut Ott, Fellbach, both of Germany, assignors to Technomatic A.G., Aesch, Luzern, Switzerland

Filed Nov. 16, 1973, Ser. No. 416,437
Claims priority, application Switzerland, Feb. 14, 1973, 2224/73
Int. Cl. F16k *11/20*
U.S. Cl. 137—596.16 **10 Claims**



1. In a valve assembly for controlling fluid pressure operated apparatus, in particular presses, having a housing, two parallel connected valves comprising two axially aligned valve chambers in said housing, axially aligned valve members in said chambers, and fluid passages in said housing controlled by axial movement of said valve members, and pilot valves controlling the axial movement of said valve members; the improvement comprising an axial bore in each of said valve members, an axially movable control pin in each of said bores for relative movement therewith and electric switch means operable by said control pins upon malfunctioning of said valves.

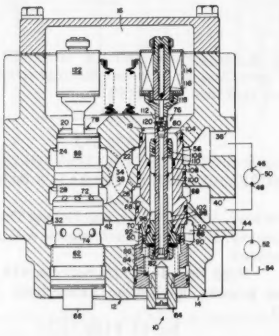
3,870,074
VALVE FOR CONTROLLING A REVERSIBLE, ROTARY HYDRAULIC MOTOR

Paul Edmund Hanser, Moline, Ill., and William Lee Snyder, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 26, 1974, Ser. No. 464,309
Int. Cl. F16k *11/00*
U.S. Cl. 137—596.16 **5 Claims**

1. A valve for controlling the flow of fluid to and from first and second work ports of a reversible, rotary hydraulic motor, comprising: a valve body defining similar first and second valve bore means having axially spaced first and second ports

and first locations arranged in that order from respective second locations; the first ports of each bore means being adpated for connection to a source of fluid pressure, the second ports of the first and second bore means respectively being adapted for connection to first and second motor work ports and the first locations of each bore means being adapted for connection to a fluid reservoir; each of said first and second bore means having a valve stem axially shiftably mounted thereon and spaced therefrom to define an annular passage extending at least between the first ports and first locations; first and second valve elements carried by each valve stem in sliding engagement with a respective bore means at respective



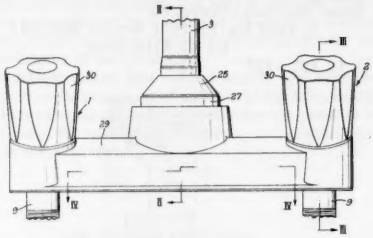
locations between the first and second ports and between the second ports and first locations thereof; each of said valve stems being shiftable in a respective bore means between a neutral position wherein the first valve element on the valve stem is engaged with a first valve surface means of the respective bore means to block fluid communication between the first and second ports while the second valve element means is spaced from second valve surface means of the respective bore means to permit fluid communication between the second port and first location, and an actuated condition wherein the first valve element is unseated from said first valve surface means and said second valve element is seated with the second valve surface means.

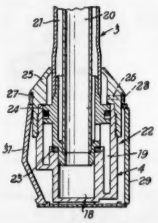
3,870,075
MIXER TAPS

Eric R. Percival, Maidstone, and Robert W. Parker, Headcorne, both of England, assignors to Reed International Limited, London, England

Filed June 1, 1973, Ser. No. 366,221
Claims priority, application Great Britain, June 20, 1972, 28787/72
Int. Cl. F16k *19/00*
U.S. Cl. 137—606 **7 Claims**

1. A mixer tap comprising:
a. a pair of manually operable valve units each having an inlet and outlet duct;
b. a central body unit formed as a one piece moulding and provided with;
i. two fluid feed ducts each of which is connected to the outlet duct of one of said valve units through a spigot amd socket connection; and
ii. a central boss portion defining respective extension ducts to said fluid feed ducts substantially at right angles thereto, one said extension duct extending from an open end centrally into the boss portion and the other extension duct being of trough form partially surrounding said first extension duct and being defined between inner and outer walls of the boss portion, the inner wall of which defines said first extension duct and the outer wall of which is higher than said inner wall, and



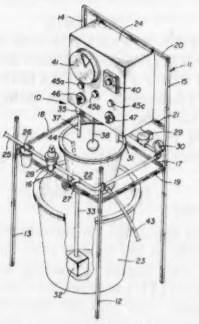


c. an outlet spout having co-axial ducts connected with said extension ducts respectively, the outlet spout sealingly engaging with said inner and outer walls of the boss portion to close the trough constituting said other extension duct.

3,870,076
AUTOMATIC LIQUID MEDICAMENT MIXER FOR TREATING ANIMALS

Charles Graznak, Platteville, Colo., assignor to Dacmont, Inc., Platteville, Colo.

Filed Mar. 26, 1973, Ser. No. 345,464
Int. Cl. F16k *19/00*
U.S. Cl. 137—607 **4 Claims**



1. A liquid mixing apparatus for accurately proportioning additives into drinking water for animals, such as poultry, livestock and the like, said mixing apparatus comprising:
a. support means;
b. reservoir means for mixing and holding a water-additive solution mounted on said support means;

c. water supply means for delivery of a quantity of water to said reservoir means at a predetermined rate;

d. means for storing and injecting a quantity of additive to said reservoir at a predetermined rate proportionate to the flow rate of the water, said additive storing and injecting means includes a storage means for storing a prepared quantity of liquid additive solution mounted on said support means below said reservoir means so as to collect overflow from said reservoir means, pump means arranged for drawing the additive from the storage means and and adjustable regulator means connected to the output of said pump means whereby the predetermined flow rate of additive solution can be injected directly into the reservoir means, the output of said pump means further including a pressure by-pass means whereby the additive can be returned to the storage means when the pressure in the additive injecting means exceeds a predetermined pressure;

e. means connected to said reservoir means for distributing the solution to a watering area for said animals whenever a demand for drinking water exists; and

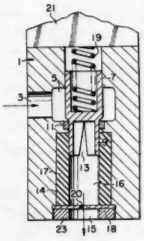
f. means for automatically controlling the flow of water and additive to said reservoir means for continuously mixing whenever the solution within the reservoir means is withdrawn below a predetermined level by said distributing means, said control means includes means for operating said pump means continuously when desired so that the prepared liquid additive when not injected into the mixing reservoir can be recirculated through the pressure by-pass means to maintain any insoluble particles within said additive in a state of suspension.

3,870,077

LOW-NOISE VALVE

Ichiro Nakamura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,558
Claims priority, application Japan, Feb. 18, 1972, 47-16405
Int. Cl. F16k *47/00*
U.S. Cl. 137—614.11 **18 Claims**



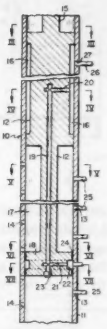
1. A valve arrangement comprising: a valve body having a fluid passage portion, a valve means disposed in said valve body for controlling the flow of fluid through said valve body, means provided downstream of said valve member extending substantially along the entire inner wall of said fluid passage portion for damping undesireable vibrations, and means disposed within said fluid passage portion downstream of said means for damping undesireable vibrations for supplying a back pressure to the downstream side of said valve member.

3,870,078

SAMPLING SLIDE VALUE

Jerome Apt, Jr.; William J. Wachter, and Wesley M. Rohrer, Jr., all of Pittsburgh, Pa., assignors to USC Incorporated, Pittsburgh, Pa.

Division of Ser. No. 195,419, Nov. 3, 1971,. This application Oct. 18, 1972, Ser. No. 298,479
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.48 **5 Claims**



1. A sampling slide valve device comprising:

A. an elongated valve body having a plurality of equally spaced sampling ports along a first end portion of one side of the valve body and a plurality of equally spaced flush ports on an opposing side of the valve body along the first end portion, a flushing port being positioned between each adjacent sampling port;

B. a movable slide member freely positioned in the valve body and having an enlarged sampling head with a sampling duct therein communicating with a central duct in the slide member, said sampling duct adapted to alternately communicate individually with each of said sampling and flush ports, respectively, said head being dimensioned to form a slight gap between the head and the valve body and to extend between adjacent flush ports when the sampling ducts is in communication with a sampling port;

C. an outlet chamber formed between the slide member and an end portion of the valve body opposite the first end portion, said central duct communicating therewith; and

D. an outlet orifice communicating with the outlet chamber.

3,870,079

THREE LEVER VALVE WITH RELIEF PORT

Harry P. Finke, 1306 Old Meadow Rd., Pittsburgh, Pa. 15241; Hugh B. Carr, 107 N. Heide Ln., McMurray, Pa. 15317, and Carl D. Wilson, Boggs School Rd., Coraopolis, Pa. 15108

Division of Ser. No. 296,823, Oct. 12, 1972, Pat. No. 3,804,124. This application Oct. 29, 1973, Ser. No. 410,828
Int. Cl. F16k *1/20*
U.S. Cl. 137—630.14 **1 Claim**

1. A valve comprising:

a. a valve body having a cylindrical opening therethrough;

b. a valve seat positioned about the opening;

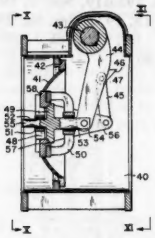
c. a valve disc positioned within the opening for mating engagement with the valve seat, said valve disc having a relief port therethrough;

d. two links and a motor driven central lever pivotably mounted so as to parallel move the valve disc away from the valve seat in a first movement and then rotate the disc through 90° to a fully open position;

e. a guide yoke mounted to said disc, said yoke having a central passageway spaced from and aligned with the relief port;

f. a centrally holed spider mounted within said relief port; and

g. a closure member mounted on a shaft extending on opposite sides thereof, through the yoke's central passageway



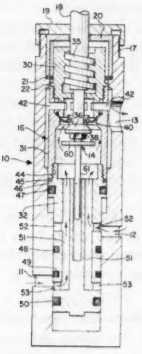
and through the central hole of the spider member and pivotally mounted to said central lever, said closure member adapted to engage a seat positioned about the relief port to close off the relief port and in an open position to engage the yoke to cause the first movement.

3,870,080

VOLUME AND TEMPERATURE REGULATING FAUCET

Hermann H. Landwehr, 9140 Linder, Morton Grove, Ill. 60053

Filed Jan. 14, 1974, Ser. No. 432,818
Int. Cl. F16k *11/18*
U.S. Cl. 137—636.4 **12 Claims**



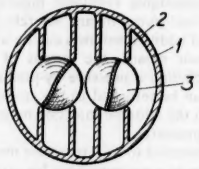
1. A volume regulating and mixing faucet for hot and cold water lines, comprising a faucet housing having an elongated bore substantially circular in transverse section, a hot water inlet, a cold water inlet, an outlet, said inlets and outlet opening into said bore at longitudinally spaced apart positions, a unitary cartridge having an outer surface generally conforming to the inner surface of said bore and mounted in said bore in cooperation with said inlets and outlet, said cartridge including an internal chamber, a stem for operating said faucet, means mounting said stem in said cartridge for rotation of said stem relative to said cartridge and for axial movements of said cartridge in said bore responsive to axial movements of said stem, first means in said cartridge responsive to certain axial movements of said cartridge in said bore for receiving and directing certain varied amounts of water from said inlets to said internal chamber, and second means in said cartridge responsive to certain rotations of said stem relative to said cartridge for receiving and directing certain varied amounts of water from said internal chamber to said outlet.

3,870,081

HEAT EXCHANGE CONDUIT

Byrge Kleppe, and Ole Torgersen, both of Raufoss, Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Feb. 9, 1973, Ser. No. 331,248
Claims priority, application Norway, Feb. 10, 1972, 370/72
Int. Cl. F15d *1/04*
U.S. Cl. 138—38 **3 Claims**



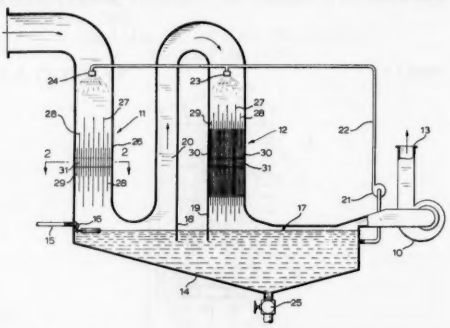
1. A heat-exchange element comprising an elongated tube having inner and outer surfaces, internal, longitudinally extending ribs projecting inwardly from the inner surface of said tube and having inner edges, and at least one additional element disposed within said tube for promoting heat exchange, said additional element being constituted by a twisted strip extending longitudinally through the tube and having a principal axis parallel to the longitudinal axis of the tube, said additional element being so dimensioned and disposed in the tube to have longitudinal edges bearing at least at certain points against the inner edges of at least two internal ribs whereby said ribs and strips cooperate to produce flow disturbance of a fluid flowing in the tube to increase heat transmission between said fluid and the wall of the tube.

3,870,082

VENTURI-TYPE DEVICES

Richard Adolf Holl, Grimsby, Ontario, Canada, assignor to Micron Engineering Inc., St. Catharines, Ontario, Canada

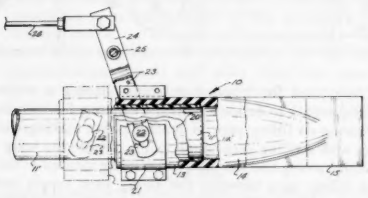
Continuation-in-part of Ser. No. 317,898, Dec. 26, 1972, abandoned. This application June 18, 1973, Ser. No. 370,895
Int. Cl. F15d *1/02*
U.S. Cl. 138—40 **35 Claims**



1. A device of venturi type comprising a passage member providing a passage for the flow of fluid therein in a predetermined direction, the passage having in the direction of flow of fluid in the passage and in the stated order an upstream section, a throat section and a downstream section, the flow cross-sectional area of the passage in the upstream section decreasing progressively toward the throat section, and the flow cross-sectional area in the downstream section increasing progressively away from the throat section, wherein at least one of said upstream and downstream sections comprises a plurality of physical barriers disposed in the passage, which barriers are spaced from each other transverse to said direc-

tion of flow and decrease the flow cross-sectional area of the part of the passage in which they are located, the said change of flow cross-sectional area being caused by differences in the said direction of flow of the physical lengths of the barriers in the corresponding section.

3,870,083
BACK PRESSURE REGULATOR FOR AUTOMOTIVE ENGINES
Jerry W. Nezat, Rt. 3, Box 1510, Estacada, Oreg. 97023
Filed Oct. 23, 1973, Ser. No. 408,510
Int. Cl. F16l *55/00*
U.S. Cl. 138—45 **4 Claims**



1. A device for attachment to the discharge end of an exhaust conduit of an internal combustion engine to restrict a passing exhaust flow, said device comprising,

a molded body of heat resistant elastomeric material having a forward segment of cylindrical shape for the reception of the exhaust conduit, said forward segment longitudinally slotted for a portion of its length, said body having a central segment with elliptical internal wall surfaces and walls of uniform thickness converging in the direction of exhaust flow resulting in the central segment being of lesser internal sectional area than the sectional area of the exhaust conduit, said body having a rearward segment with opposed walls having substantially parallel internal wall surfaces, in the absence of exhaust flow, terminating in an elongate orifice at the rearward end of said body, said orifice being of substantially less section area than the exhaust conduit to thereby constitute a restriction to the exhaust flow, said body and particularly the walls of said rearward section being responsive to various exhaust pressures to exert a desired restrictive effect on the exhaust flow, said body adapted for repositioning forwardly along the exhaust conduit whereby the conduit end will mechanically bias the internal walls of the central segment away from one another to reduce the restrictive effect of the device on an exhaust flow, and

clamping means circumposed about the molded body and retaining same at a selected position relative to the end of the exhaust conduit.

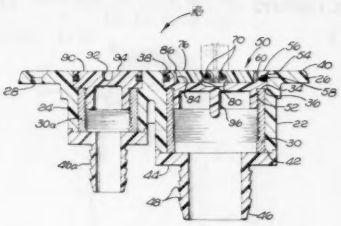
3,870,084
PIPE FITTING CLOSURE
Walter A. Gezari, Killingworth, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 15, 1972, Ser. No. 315,410
Int. Cl. F16l *55/00*
U.S. Cl. 138—89 **5 Claims**

1. A fitting for mounting on a boat deck, said fitting being adapted to be connected to a waste disposal system in the boat, comprising:

a body formed with first and second pairs of inlet and outlet ports, said outlet ports being above said inlet ports;

first and second plugs threaded into said first and second outlet ports, respectively;

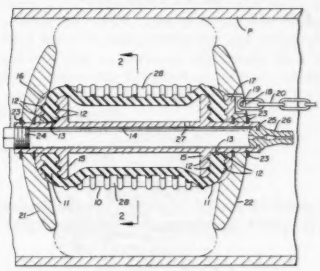
pivotable handle means on the top of said first plug adapted to be raised from a normal horizontal position to a vertical position to facilitate threading and unthreading of said plug in its respective outlet port;



a slot in the upper surface of said second plug; and

a lug on the bottom of said first plug engageable in said slot to facilitate threading and unthreading of said second plug in its respective outlet port.

3,870,085
EXPANSIBLE PLUGS FOR SEWER PIPES
Michael Schneider, 1120 S. Union Ave., Alliance, Ohio 44601
Filed June 20, 1973, Ser. No. 366,134
Int. Cl. F16l *55/12*
U.S. Cl. 138—93 **4 Claims**

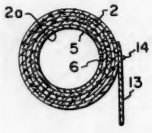


1. An expansible plug consisting of a tubular core having spaced flanges inwardly of its ends, a cylindrical expansible member having thickened inturned ends positioned over said flanges so as to extend therebetween, annular ribs on said thickened inturned ends, apertured discs positioned on said tubular core beyond said flanges, annular grooves in said apertured discs and means for securing said apertured discs to said tubular core and in engagement with said thickened inturned ends of said expansible member with said ribs and grooves in registry, a plug in one end of said tubular core and a valve stem positioned in the other and whereby air introduced into said tubular core through said valve stem may communicate with said expansible member through an opening in said tubular core, secondary apertured discs on said tubular core on the opposite outer sides of said first mentioned apertured discs, the diameter of said secondary apertured discs being substantially larger than the diameter of said first mentioned apertured discs, and a flexible means on one of said first mentioned apertured discs extending through an opening in one of said secondary apertured discs for retrieving said expansible plug from a sewer pipe.

3,870,086
TUBE CONSTRUCTION

Martin H. Stark, 109 N. Wheeler, Saginaw, Mich.

Filed Aug. 24, 1973, Ser. No. 391,304
Int. Cl. F16l 9/16
U.S. Cl. 138—172 13 Claims

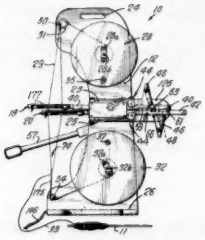


1. A tube construction comprising an elongate, hollow tube; and an elongate reinforcing member fitted within said tube, said reinforcing member comprising a sleeve formed of resilient, springy material having a slot extending the full length thereof, said sleeve prior to being fitted into said tube having an outer diameter greater than the inner diameter of said tube.

3,870,087
HAND LOOM

Charles Frederick Henwood, 7 Roosevelt Ave., Apt. 7, Montreal, Quebec, Canada

Filed Aug. 3, 1973, Ser. No. 385,479
Claims priority, application Great Britain, Aug. 8, 1972, 36967/72
Int. Cl. D03d 29/00
U.S. Cl. 139—33 8 Claims

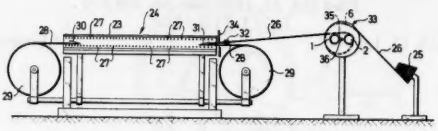


1. A portable compactible hand loom comprising a main frame, first and second heddle frames, having heddles mounted therein, movably mounted on said frame, first and second members, said first member being connected to said first heddle frame and said second member being connected to said second heddle frame; said first and second members having facing sides with facing recesses defined therein and a roller member contained in said facing recesses; retaining means for retaining said members in juxtaposed facing relationship during relative movement thereof, and means for moving said members simultaneously a predetermined distance in opposite directions, whereby a corresponding movement is produced in said heddle frames, to create in use a shed in a warp passing through the heddles for the passage of a weft.

3,870,088
APPARATUS FOR WITHDRAWING AND STORING FILLING YARN IN STATIONARY FILLING SUPPLY WEAVING MACHINES

Walter Scheffel, Industriestr. 53, 8832 Weissenburg, Germany

Filed May 23, 1973, Ser. No. 363,138
Claims priority, application Germany, May 23, 1972, 2224933; Oct. 9, 1972, 2249393
Int. Cl. D03d 47/36
U.S. Cl. 139—122 R 10 Claims

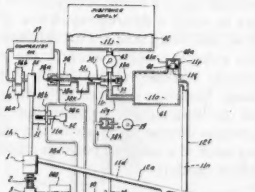


1. Apparatus for weaving machines having a warp shed including means to define a path and a system for withdrawing and storing of filling yarn in machines for making web-like fabrics with a filling yarn supply being outside the warp shed, said withdrawing and storing system being located in the path of the filling yarn between the filling yarn supply and the weaving machine and incorporating at least one mechanically-driven drum means for withdrawing the filling yarn from the filling yarn supply, the filling yarn being controlled about said drum to be alternately stored and released under the influence of fluid, means including portions having edges arranged to form chambers collectively around the drum means and a cylinder having a shell defining a perimeter matching the length of the filling yarn to be stored around said drum means, siad shell having surfaces to deposit the stored filling yarn and having openings for the discharge of fluid from the chambers formed by the partitions of the cylinder.

3,870,089
ANTIDRIP VOLUMETRIC RAPID FILLING MACHINE

Herman Laub, III, 244 N. San Marino, San Gabriel, Calif. 91775

Filed June 12, 1972, Ser. No. 261,913
Int. Cl. B65b 3/12, 31/04, 57/08
U.S. Cl. 141—44 46 Claims



1. A system for filling containers with flowable substance from a source thereof, comprising:

a volumetric metering chamber adapted to be connected to receive such substance from the source, and a bi-acting piston adapted for motion between predetermined limits within the chamber, for establishing controlled volumes of such substance;

a submersible nozzle, connected to receive such controlled volumes of substance from the chamber, for discharge of such controlled volumes into such containers; and

means for consistently removing drops of such substance from the nozzle tip after completion of each such discharge, without affecting the body of the substance in such container, comprising:

means defining a vessel;

means for establishing within the vessel a negative pressure with respect to ambient atmospheric pressure;

means providing physical communication between the interior of the vessel and the immediate vicinity of the nozzle tip; and

means for interrupting said communication during each such discharge, and after each such discharge while the nozzle tip contacts the body of the substance in such container;

whereby drops of substance are sucked via the physical communication means and away from the immediate vicinity of the nozzle tip after each such discharge, but not until the nozzle tip is moved out of contact with the body of the substance.

3,870,090

ARRANGEMENT IN PLANING MACHINES WITH FEEDING MECHANISM COMPRISING AT LEAST TWO ROLLERS

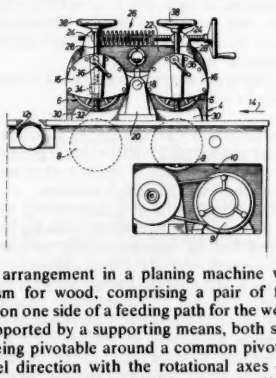
Morten Birger Hasfjord, Odeshog, Sweden, assignor to Svenska Industrietablerings AB (Svetab) Swedish Industrial Establishing Corporation, Stockholm, Sweden

Filed Mar. 20, 1973, Ser. No. 342,987

Claims priority, application Sweden, Mar. 20, 1972, 3565/72

Int. Cl. B27c 1/12

U.S. Cl. 144—249 R **8 Claims**



1. An arrangement in a planing machine with a feeding mechanism for wood, comprising a pair of feeding rollers disposed on one side of a feeding path for the wood each roller being supported by a supporting means, both said supporting means being pivotable around a common pivot axis disposed in parallel direction with the rotational axes of the feeding rollers, said feeding rollers having pressure adjustment means associated therewith for setting the pressure of the feeding rollers against wood fed on the feeding path in order to adapt said pressure to the thickness of the wood through swinging movement of said supporting means downwards around the common pivot axis, characterized in that said pressure adjustment means comprises a compression spring device located on the side of the common pivot axis facing away from the feeding path and acting between a first bearing means located at one of said supporting means and a pressure controlling element displaceable in the direction of action of the compression spring device in a second bearing means located at the other supporting means, both of said bearing means being pivotable in the corresponding supporting means around a corresponding axis extending in parallel direction with said common pivot axis, an adjustable counter action device being arranged to hold the rollers against the action of the spring tension force when no wood is present on the feeding path.

3,870,091

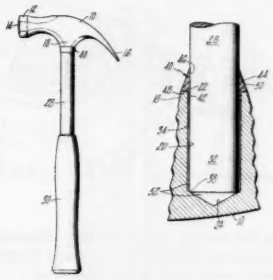
HAND TOOL CONNECTION AND TRIM COLLAR THEREFOR

Oscar Burge Burgeson, Bristol, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Apr. 23, 1974, Ser. No. 463,403

Int. Cl. B25d 1/00

U.S. Cl. 145—29 R **5 Claims**



1. A hand tool for percussive use comprising a tool head having a closed handle-receiving eye with a generally concave interior end wall, a handle having an end portion positioned within the eye a sufficient distance to engage said end wall, said handle portion being substantially free of direct contact with the tool head except at the end wall to provide an annular space extending fully around the handle portion within the eye, a preformed, annular trim collar sealably interconnecting the handle and the tool head comprised of an exposed trim portion and a concealed skirt portion having substantially the same cross-sectional dimension as the annular space and being disposed within the space, said skirt portion being held in position by a force fit interconnecting and cooperating with the tapered end wall to maintain the handle in a stabilized axial position within the eye; and an impact resistant resin disposed within said annular space for bondably joining said tool head and said handle.

3,870,092

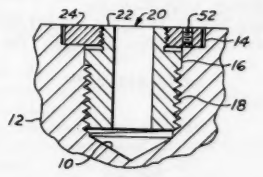
GUIDE BUSHING

Gerald Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa, Mich., assignors to The Freeman Supply Company, Toledo, Ohio

Filed May 29, 1973, Ser. No. 364,971

Int. Cl. F16b 39/00

U.S. Cl. 151—14 R **10 Claims**



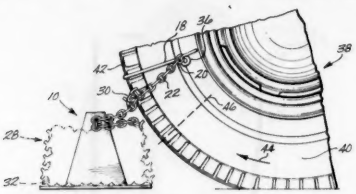
1. A bushing for aligning sections of mold equipment and the like comprising: a generally tubular member having an axially extending opening therethrough with wrench engagement surfaces in tis sidewalls, said tubular member having a first run of external threads on one end and a smaller diameter second run of external threads on the other end, said second run having a greater pitch than said first run, a flange ring threaded on said second run of threads, and means for locking the side of said flange ring facing said first run of threads to external structure.

3,870,093

TIRE CHAIN HOLDER AND DISPENSER

Louis A. Driggers, 7800 78th Ave., S.E., Mercer Island, Wash. 98040

Filed June 28, 1973, Ser. No. 374,346
Int. Cl. B60c 27/00
U.S. Cl. 152—213 1 Claim



1. A method for storing tire chains on a dispensing device, said tire chains having side chains and cross chains interconnecting said side chains, said device including

a relatively horizontally disposed base member for supporting the weight of a tire chain thereon,

a pedestal means mounted on and extending upwardly from said base member, said pedestal means having at least four corner portions between which are defined at least two upright lateral sides and at least two upright longitudinal sides, and

handle means connected to said device for carrying said device,

the method comprising:

placing a first portion of each of said side chains on said base means along respectively opposite ones of said lateral sides of said pedestal means, said first portion of each of said side chains being mutually adjacent ends of said side chains,

placing a first cross chain on said base means along a first longitudinal side of said pedestal means,

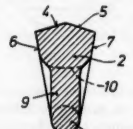
thereafter placing a subsequent portion of each of said side chains between adjacent crosslinks along respectively opposite ones of the lateral sides of said pedestal means to stack said side chains in an accordion manner and serially placing subsequent cross chains along alternate ones of said longitudinal sides of said pedestal means.

3,870,094

CHAIN LINK FOR ANTISKID AND TIRE PROTECTIVE CHAINS

Werner Schurle, Dewangen, and Anton Muller, Unterkochen, both of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

Filed July 23, 1973, Ser. No. 381,367
Claims priority, application Germany, July 25, 1972, 22363491
Int. Cl. B60c 27/04
U.S. Cl. 152—243 5 Claims



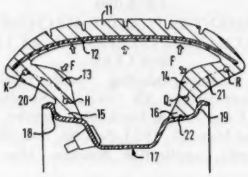
1. A one-piece, integral, cast tire chain tread link of substantially rectangular shape with rounded corners, said link having a marginal tire-engaging section along one of the longer sides, and a ground-engaging section along the other of the longer sides, the intermediate section having short sides on the ends and a central web joining the two longer sides, so as to form two chain-engaging openings separated by said central web, said ground-engaging section being substantially wider transversely of the link and having a substantially greater cross-sectional area than said tire-engaging section with two, longitudinal ground-engaging surfaces intersecting at an obtuse angle, said short sides having an elliptical cross section said cast link is formed of cast steel material having a carbon content of 1% to 1.4%, a manganese content of 5% to 18%, a nickel content of approximately 1.8%, to 2.4%, and after production in casting procedure, the link is subjected to a heat treatment of 450°C to 1,050°C.

3,870,095

PNEUMATIC TIRE FOR VEHICLE WHEELS WITH INWARDLY DIRECTED SIDEWALL CONVEXITY

Giorgio Tangorra, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed July 23, 1973, Ser. No. 381,482
Claims priority, application Italy, Aug. 4, 1972, 27897/72
Int. Cl. B60c 13/00, 9/18
U.S. Cl. 152—353 C 13 Claims



1. In combination, a rigid rim of a vehicle wheel and a pneumatic tire, said rim having annular flanges adapted to receive and lock the beads of a tire in spaced apart relationship, said pneumatic tire comprising

sidewalls having beads adapted to be locked in spaced apart relationship by said rim,

a tread,

an annular substantially rigid reinforcing structure reinforcing the tread and having a width which is greater than the spacing between the beads of the tire when mounted on the rim with the beads locked in position,

said sidewalls being formed of a substantially elastomeric material, flaring from the beads towards the lateral ends of the tread and having an inwardly directed convex crosssection under normal inflation pressures, each sidewall forming a first imperfect hinge adjacent to the bead and forming a second imperfect hinge adjacent to the tread for rotation of the sidewall intermediate the hinges, whereby upon application of vertical loads to the tire, said intermediate portions rotate to reduce their inclination by approaching a horizontal line and the distances of said sidewalls from the median plane of the wheel increase at least in correspondence to said intermediate portion.

3,870,096

LOCKING DEVICE FOR ROLL-UP AWNINGS

Robert E. Horrell, Northridge, Calif., assignor to Carter Mfg., Inc., Sun Valley, Calif.

Filed June 11, 1973, Ser. No. 368,763
Int. Cl. E06b 9/208
U.S. Cl. 160—305 10 Claims

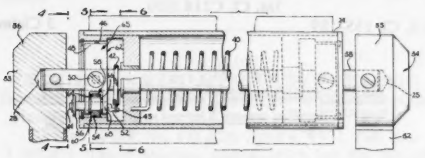
1. A locking apparatus for use in a roller comprising:

a brake drum;

a brake carrying means mounted within said drum for relative rotation within said drum;

a brake, rotatably mounted to said brake carrying means for contacting said drum, said brake having a first position in

which relative rotation in a first direction between said drum and brake carrying means is prevented and where rotation in a second direction is permitted, and a second position in which relative rotation in said second direction between said drum and brake carrying means is



prevented and where rotation in said first direction is permitted;

whereby an awning or the like mounted to said locking apparatus may be locked in a plurality of positions while moving in either direction.

3,870,097

METHOD FOR THE ACCURATE WEIGHT CASTING OF METAL PLATES

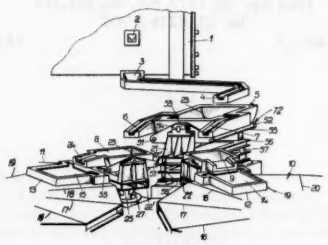
Otto Kreuz, Duisburg, and Stephan Raab, Essen, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Continuation of Ser. No. 62,051, Aug. 7, 1970, abandoned. This application Sept. 8, 1972, Ser. No. 287,471

Claims priority, application Germany, Mar. 12, 1970, 2011698

Int. Cl. B22d *39/00*

U.S. Cl. 164—4 **4 Claims**



1. A method for the accurate weight casting of metal plates, particularly for supplying melt to an open top mold so that only the accurately determined weight is fed to the mold for each casting operation and, in particular, for casting copper anode plates using weighing means such as force analyzers for pivotally supporting tiltable metallurgical vessels and using a large receiving vessel and at least one small casting mold pouring vessel, comprising pouring the precise quantity of melt required for one anode plate from the smaller vessel after it is filled with a quantity of melt which is 2 to 3 times the quantity of melt required for the single anode plate casting, and thereafter prior to the casting of the next anode plate, filling the smaller vessel with a quantity of melt necessary for one anode plate from the larger vessel from which the pouring is continued until the twice to three times the initial quantity is again attained as determined by weighing the large receiving vessel.

3,870,098

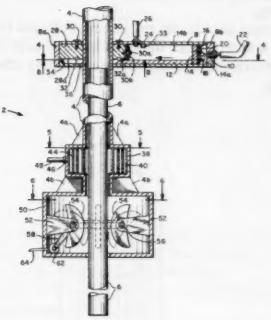
REMOTELY CONTROLLABLE SUBTERRANEAN OIL WELL VALVE

William T. Houston, Oak Dr. off Bald Rock Rd., Star Rte. 93, San Jose, Calif. 95910

Filed Aug. 13, 1973, Ser. No. 388,035

Int. Cl. E21b *29/00*

U.S. Cl. 166—55.1 **6 Claims**



1. A well pipe flow control apparatus adapted for placement below ground comprising in combination:

a. a casing having a longitudinal axis and a transverse inside diameter slightly larger than the well pipe;

b. a chamber extending from said casing transverse to the longitudinal axis of said casing;

c. blade means contained in said chamber and movable in a radial direction responsive to fluid pressure for shearing the well pipe positioned in said casing;

d. external sealing means contained along a portion of said casing and disposed below said blade means, said external sealing means being responsive to and communicating with a pressurized fluid so that the pressurized fluid forces said external sealing means against the well pipe periphery to prevent the seepage of ground fluid therealong; and

e. pipe holding means carried within the bottom portion of said casing so as to be disposed below said external sealing means, said pipe holding means being capable of locking the portion of the well pipe within said casing.

3,870,099

SEAL ASSEMBLY

Walter Wolowodiuk, New Providence, N.J., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 19, 1972, Ser. No. 254,973

Int. Cl. F28f *9/22, 7/00*

U.S. Cl. 165—82 **3 Claims**

1. A heat exchanger comprising:

a cylindrical side wall;

a primary fluid inlet in said side wall;

a primary fluid outlet in said side wall below said primary fluid inlet;

an inner core, said inner core comprising:

an upper tube sheet;

a plurality of heat exchange tubes extending downward from said upper tube sheet for flowing a secondary fluid;

a cylindrical shroud encircling said heat exchange tubes, and extending substantially over the entire length of said heat exchange tubes, said shroud being coaxial with and within said side wall;

a seal assembly positioned between said side wall and said shroud below said primary fluid inlet comprising:

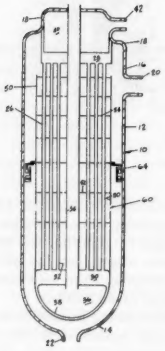
a first annular lip extending inward from said side wall toward said shroud;

an annular vertical seal wall connected at its bottom with said lip in a fluid tight connection,

a seal ring encircling said seal wall, said seal ring having a plurality of annular grooves in its inner surface and a plurality of pressure rings held within said grooves and engaging against the outer vertical surface of said seal wall;

a plurality of first springs between said lip and said seal ring;

a second annular lip projecting outward from said shroud at a level higher than the level of said first annular lip; a horizontal annular plate extending above said second lip;



a first annular gasket held between said second lip and said horizontal annular plate;

a cylindrical seating member extending downward from said annular plate, said cylindrical seating member secured to said annular plate at the outer marginal portion of said annular plate;

a second annular gasket engaging the bottom of said cylindrical seating member and the top of said seal ring; a plurality of second springs connected with said annular horizontal plate and said second annular lip urging said annular horizontal plate downward so that said first gasket is compressed between said second lip, and said horizontal annular plate and said second gasket is compressed between the bottom of said seating member and the top of said seal ring whereby when said primary fluid flows through said primary fluid inlet the annular space between said shroud and said side wall above said seal assembly will be filled with fluid and primary fluid and will flow downward through said cylindrical shroud to below said seal assembly and then out through said primary fluid outlet and whereby when a surge of pressure urging said primary fluid to flow from said primary fluid outlet into said heat exchanger occurs, said second springs will extend when said pressure reaches a predetermined value to allow said horizontal annular plate and said cylindrical seating member to move upward, so that said first annular gasket and said second annular gasket will no longer be compressed to allow primary fluid to flow upward through said seal assembly into the space above said seal assembly between said shroud and said side wall.

3,870,100

CONVEYOR AXLE FOR A TRAVELING GRATE

Reinhard Korting, and Alois Kluger, both of Neubeckum, Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Aug. 31, 1973, Ser. No. 393,649

Claims priority, application Germany, Dec. 5, 1972, 7244486

Int. Cl. C21d 9/00

U.S. Cl. 165—89 **3 Claims**

1. A conveyor axle for a traveling grate, said axle having an outer wall, a first conduit within said wall extending inwardly of said axle from one end thereof and being spaced from said wall to form a first passage surrounding said first conduit; a second conduit within said wall extending inwardly of said axle from its other end and being spaced from said wall to form a second passage surrounding said second conduit, said axle having inlet openings at its ends in communication with the respective conduits for supplying the latter with coolant, said passages being in communication with discharge openings at the ends of said axle for discharging coolant from the respective passages, said first conduit being in communication with said second passage and said second conduit being in communication with said first passage whereby coolant introduced to the first and second conduits passes to the second and first passages, respectively.

3,870,101

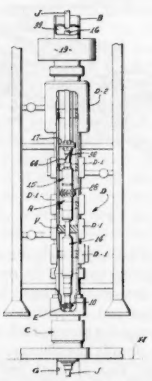
REMOVABLE SUBSEA PRODUCTION TEST VALVE ASSEMBLY

Sydney S. Helmus, Seabrook, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Apr. 25, 1973, Ser. No. 354,334

Int. Cl. E21b 33/00

U.S. Cl. 166—.5 **43 Claims**



1. In a valve assembly adapted to be lowered on the tubular string into position within a blowout preventer stack at the upper end of a well bore underlying a body of fluid: a housing structure adapted to be subjected to the hydrostatic head of the body of fluid and having a fluid flow passage therethrough: a valve member shiftable in said housing structure between positions opening and closing said passage; pressure responsive means for shifting said valve member to open position means for conducting fluid under pressure to said pressur

responsive means to shift said valve member to open position; closing means for shifting said valve member to closed position upon decrease in fluid pressure in said conducting means; and means for subjecting said pressure responsive means to the hydrostatic head of fluid surrounding said housing structure to offset the hydrostatic head of fluid in said conducting means.

3,870,102

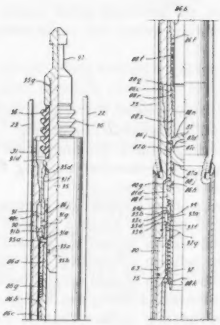
SUBSURFACE WELL APPARATUS AND METHOD

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Division of Ser. No. 131,629, April 6, 1971, Pat. No. 3,767,471. This application June 8, 1973, Ser. No. 368,292

Int. Cl. E21b *43/12*

U.S. Cl. 166—72 **28 Claims**



1. A flow control assembly adapted for movement through a bore of a well tubing to a subsurface location for securing in the bore of the well tubing for controlling flow of fluid through the bore of the well tubing in response to controlled movement of a control member mounted with the well tubing and engaged by the flow control assembly when releasably secured at the subsurface location including:

a frame means movable through the bore of the tubing to and from the subsurface location;

flow plug means mounted with said frame means for movement to and from an open position for enabling flow of fluid through the bore of the well tubing and a closed position for blocking flow of fluid through the bore of the well tubing;

means mounted with said frame means for imparting movement to said plug means by engagement at the subsurface location with a movable control member mounted with the well tubing at the subsurface location to move said flow plug means to and from open and closed positions in response to controlled movement of the control member at the subsurface location; and

means for releasably securing said frame means with the well tubing at the subsurface location and in engagement with the movable control member wherein said flow plug means controls the flow of fluid through the bore of the tubing.

3,870,103

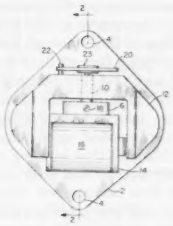
ELECTROMAGNETIC INSTRUMENT TAPPING DEVICE

Donald J. Abel, Franklin Lakes, N.J., assignor to Meto Corporation, Park Ridge, N.J.

Filed Apr. 2, 1974, Ser. No. 457,236

Int. Cl. B25d *13/00*

U.S. Cl. 173—100 **16 Claims**



1. Apparatus for periodically tapping a device of the type subject to static friction for relieving said friction, comprising:

a base adapted to be secured to the device;

an electromagnet, and means associated with the base and supporting the electromagnet;

an armature, and means supporting the armature for displacement relative to the base;

the electromagnet and armature supported in positions relative to each other to provide a predetermined magnetic path;

means periodically energizing the electromagnet to generate a magnetic force which displaces the armature in one direction to tap the base with a first force;

means biasing the armature to displace said armature in an opposite direction when the electromagnet is deenergized to tap the base with a second force; and

the first and second forces transmitted through the base to the device to relieve the static friction.

3,870,104

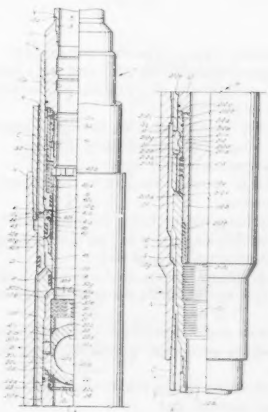
SUBSURFACE SAFETY VALVE WELL TOOL OPERABLE BY DIFFERENTIAL ANNULAR PRESSURE

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Filed May 14, 1973, Ser. No. 359,757

Int. Cl. E21b *43/10, 43/12*

U.S. Cl. 166—224 A **18 Claims**



1. A subsurface safety valve well tool apparatus adapted for connecting in a production tubing to control flow of well fluids

through the bore of the production tubing at a subsurface location in a well, including:

a flow housing having a bore formed therethrough and comprising a first housing portion and a second housing portion, said housing adapted for connection in the production tubing to form a portion thereof with said bore in communication with a flow passage of the production tubing for enabling flow of fluid through said bore;

bore closure means mounted with said housing and disposed in said bore for movement to and from an open position for enabling flow of fluid through said bore and a closed position for blocking flow of fluid through said bore;

means mounted with said flow housing for effecting movement of said bore closure means to and from the open and closed position, said means for effecting movement responsive to a controlled application of fluid pressure communicated to said flow housing independently of the fluid flow controlled by said bore closure means; and

means with said flow housing for releasably securing said first portion of said flow housing with said second portion of said flow housing to enable removal of said bore closure means with one of said portions of said flow housing from the well wherein the well tool apparatus is operated.

3,870,105

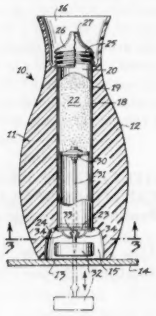
DECORATIVE FIRE EXTINGUISHER

James Bartley Gooch, 2005 Rogers St., Clearwater, Fla. 33516

Filed Nov. 23, 1973, Ser. No. 418,478

Int. Cl. A62c *11/00*

U.S. Cl. 169—33 **6 Claims**



1. A decorative fire extinguisher comprising:

a. an elongated body having a top end and a bottom end and an aesthetically appealing exterior side surface adapted to be held in one hand,

b. a chamber within said body having an upper open end, for receiving a fire extinguishing material,

c. an upper recess in said top end,

d. a discharge spout connected to the upper open end of said chamber,

e. said discharge spout being received within said upper recess, so that no portion of said discharge spout projects above the top end of said body,

f. discharge means within said chamber actuable to discharge said extinguishing material through said discharge spout,

g. said bottom end comprising a flat base portion supporting said body in an upright position upon a horizontal flat surface,

h. a bottom recess within said bottom end opening through said base portion, and

i. manual actuator means normally within said bottom recess and operatively connected to said discharge means for actuating said discharge means.

3,870,106

SUPPORTING LINKAGE ARRANGEMENT FOR EARTH WORKING TOOL

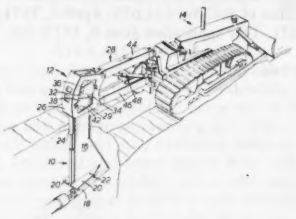
William Robert Frederick Gosling, Olive House, Aldborough, Boroughbridge; David John Wakefield, 36 Pinewood Ave., Flanshaw Park, and Terry Long, Leroyne, North Drive, Bramhope, all of England

Filed June 4, 1973, Ser. No. 366,962

Claims priority, application Great Britain, June 2, 1972, 25972/72

Int. Cl. A01b *65/06, 13/08*

U.S. Cl. 172—239 **13 Claims**



1. A linkage arrangement for inter-connecting first and second units, said arrangement comprising:

a. a first supporting member for connection to said first unit, the first supporting member defining first and second curved bearing surfaces;

b. a second supporting member for connection to said second unit and movable relative to said first supporting member, the second supporting member including first pivot means defining a first pivot axis nearer to said first bearing surface than to said second bearing surface and second pivot means defining a second pivot axis nearer to said second bearing surface than to said first bearing surface; and

c. follower means controlling relative movement of said first and second supporting members, the follower means comprising a first quadrant pivotally mounted adjacent the apex thereof by said first pivot means for movement about said first pivot axis with the arcuate surface thereof in contact with said second bearing surface and a second quadrant pivotally mounted adjacent the apex thereof by said second pivot means for movement about said second pivot axis with the arcuate surface thereof in contact with said first bearing surface.

3,870,107

TOOL BAR LIFT ASSIST WHEEL

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed June 11, 1973, Ser. No. 368,955

Int. Cl. A01b *63/22*

U.S. Cl. 172—413 **9 Claims**

1. A tool bar assembly comprising,

an elongated tool bar,

hitch means connected to said tool bar,

ground working tools on said tool bar,

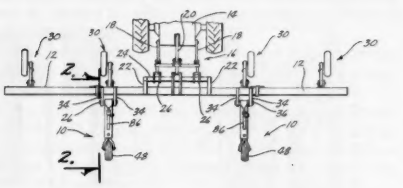
a rearwardly extending arm pivotally connected to said tool bar and a ground-engaging wheel means on the lower end of said arm,

a hydraulic power cylinder operatively connected between said tool bar and said arm for raising and lowering said arm,

a hydraulic accumulator connected to said power cylinder to receive fluid from said power cylinder when a predetermined upward force is applied to said arm and return said fluid upon said force being removed to relieve strain

on the power cylinder and associated hydraulic equipment,

said accumulator including a cylinder, a piston movable in said cylinder, a yieldable pressure means for selectively applying pressure to one side of said piston, and said power cylinder being connected to the cylinder of said accumulator on the other side of said piston whereby fluid introduced into said cylinder is opposed by said pressure means,



adjustment means being provided for varying the point along said arm where said power cylinder is connected to said arm,

said power cylinder being connected at one end to said arm through a post pivotally connected to said arm and said adjustment means is an extendable member connected to and between said post and said arm whereby adjustment of said adjustment means, pivots said post.

3,870,108

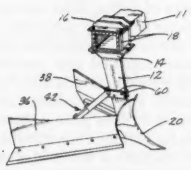
SEEDBED SPLITTER AND SHAPER

Henry Orthman, Lexinton, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Oct. 3, 1973, Ser. No. 403,285

Int. Cl. A01b *39/20*

U.S. Cl. 172—722 **5 Claims**



1. A ground working implement comprising,

a tool bar,

a shank having upper and lower ends,

said shank connected at its upper end to said tool bar and extending downwardly therefrom,

a shovel on the lower end of said shank,

a pair of mold boards having rearward and forward ends,

said pair of mold boards vertically and horizontally pivotally connected at their forward ends to said shank and extending rearwardly and outwardly therefrom,

an inverted laterally and longitudinally extendable T-shaped member having a cross and a mast, said cross having opposite ends, said mast having a free end, the opposite ends of said cross being pivotally connected to the rear ends of said mold boards and the free end of said mast being pivotally connected to said shank above the connection of the mold boards to said shank,

means for selectively vertically adjustably connecting the forward ends of said mold boards to said shank whereby said mold boards may be moved vertically with respect to said shank.

3,870,109

HYDRAULIC DRILLING OR SERVICING RIG

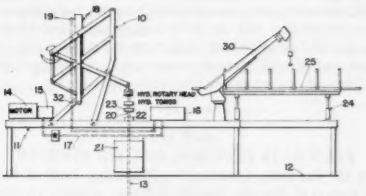
Benjamin C. Gray, Box 1646, Brooks, Alberta, Canada

Filed Mar. 22, 1974, Ser. No. 453,832

Claims priority, application Canada, Apr. 11, 1973, 168664

Int. Cl. E21b *3/02, 19/08*

U.S. Cl. 173—38 **10 Claims**



1. In an hydraulic drilling rig which includes supporting structure, a source of power, an hydraulic pump, a control panel and hydraulic hoses interconnecting same; the improvement comprises an operating unit mounted upon said supporting structure, said unit comprising in combination support members extending upwardly from said supporting structure, a parallelogram outer linkage system pivotally secured by one end thereof to said support members, an hydraulic piston and cylinder assembly, a rotary head supporting linkage system pivotally secured intermediate the ends thereof to said cylinder intermediate the ends thereof, a rotary head pivotally securing one end of said supporting linkage system, and link means interconnecting said piston rod to said outer linkage system, the other end of said supporting link system being pivotally connected to the other end of said outer linkage system.

3,870,110

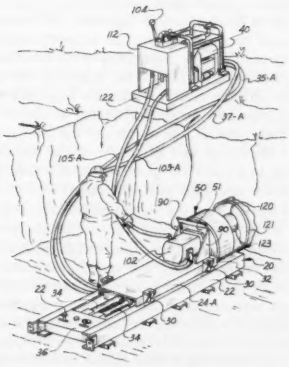
POWER TRAIN FOR HORIZONTAL EARTH BORING MACHINE

Albert R. Richmond, West Salem, and William S. Appleman, Ashland, both of Ohio, assignors to The Richmond Manufacturing Company, Ashland, Ohio

Division of Ser. No. 153,281, June 15, 1971, , and a continuation-in-part of Ser. No. 85,600, Oct. 30, 1970, Pat. No. 3,769,006. This application Mar. 1, 1973, Ser. No. 337,211

Int. Cl. E21c *1/10*

U.S. Cl. 173—163 **3 Claims**



1. A portable earth boring machine comprising, in combination, track means, carriage means mounted for movement

along said track means and including an upper carriage frame portion removably mounted on said carriage means for operational use in either a carriage mounted or a remote location; an engine mounted on said upper carriage frame portion; variable volume pump means mounted on said upper carriage frame portion and driven by said engine; fluid motor means mounted on said carriage means; flexible conduit means for connecting said fluid motor to said pump means in either of said locations; auger connecting shaft means including a front end for connection with an earth boring auger and a rear end driven by said fluid motor; and a casing pusher ring at the forward end of said carriage means in surrounding relationship with said auger connecting shaft means.

3,870,111

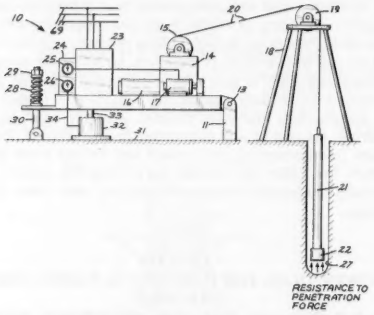
FEED RATE CONTROL FOR JET PIERCER

Robert M. Tuomela; Gustave W. Schroeder, both of Babbitt, and Robert O. Mattila, Ely, all of Minn., assignors to Reserve Mining Company, Silver Bay, Minn.

Filed Sept. 10, 1973, Ser. No. 395,976

Int. Cl. E21b *7/14, 19/08*

U.S. Cl. 175—11 **8 Claims**



1. A jet piercing drilling machine having automatic drilling feed rate control, comprising, in combination:

a. a frame support member;

b. a frame pivotally attached to the frame support member;

c. a burner assembly;

d. hoist assembly means mounted on the frame for supporting the burner assembly so that the burner assembly normally counterbalances the weight of the frame and hoist assembly about the frame support member;

e. weight cell means associated with the frame and operable to produce control signals indicative of the resistance to penetration of the burner assembly, in response to the pivoting of the frame about the support member;

f. motor means drivably connected to the hoist assembly for raising and lowering the burner assembly into a drill hole;

g. a motor driving circuit having an input for receiving a speed command voltage, and having an output connected to the motor means, the motor driving circuit operable to control the speed and direction of the motor means in response to a received speed command voltage;

h. a transistor amplifier normally connected to receive the control signals from the weight cell means, and connected to the motor driving circuit for supplying a speed command voltage thereto, the transistor amplifier operable in a normal mode to vary the speed command voltage in response to the control signals so as to maintain the drilling feed rate substantially inversely proportional to the instantaneous resistance to penetration of the burner assembly, over a predetermined range of operation; and,

i. means for switching a bias signal into the input of said transistor amplifier when a predetermined drilling condition is encountered, whereby a predetermined fixed drilling speed command voltage is produced in response thereto.

3,870,112

DEVICE FOR TAKING SAMPLES FROM LOOSE GROUND LAYERS

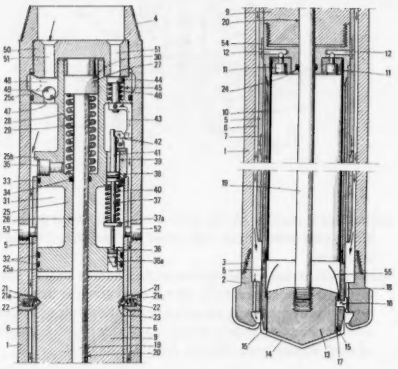
Yvon Castel, Le Pecq, and Andre Castela, Mesnil Le Roi, both of France, assignors to Institut Francais Du Petrole Des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Feb. 12, 1974, Ser. No. 441,895

Claims priority, application France, Feb. 20, 1973, 73.06000

Int. Cl. E21b *49/02, 25/00, 9/20*

U.S. Cl. 175—93 **18 Claims**



1. A device for sampling cores from loose ground layers, comprising a rigid tubular body, a core barrel housed in said tubular body and slidable therein under the action of controlled propulsion means, from a first position, in which said core-barrel is secured through locking means to said tubular body, to a second position in which said core barrel at least partially projects beyond said tubular body and penetrates the loose ground layer, this rigid tubular body being adapted to be connected to a source of drilling fluid and to means for driving in rotation said tubular body and comprising, in combination, a crown-type drill bit provided with a bore through which said core barrel can slide from said first position to said second position, an obturator means for said core barrel, said obturator means being slidably mounted in said core barrel and being provided at its lower part with ground cutting elements, said obturator means being further connected to said core barrel and maintained substantially at the level of said drill bit in said first position of said core barrel, the lower end of said core barrel being also provided with ground cutting elements and being also located at the level of said drill bit in said first position of said core barrel, said lower end and said obturator means thus cooperating with said core barrel for obturating the bore of the drill bit by the cutting elements, thereby preventing the formation of a core within said bore in said first position which thus defines a position of full bore drilling of the device.

3,870,113

PNEUMATIC DRILL APPARATUS

Newell E. Slawson, 319 Cleveland Ave., Garnett, Kans. 66032

Filed Feb. 14, 1974, Ser. No. 442,350

Int. Cl. E21b *1/06, 3/08*

U.S. Cl. 175—96 **9 Claims**

7. A pneumatic drilling apparatus adapted to be secured to an end of a drill pipe and rotatable thereby for drilling, said apparatus comprising:

a. a housing having at least two cylinders therein;

b. a piston reciprocably mounted in each said cylinder with said pistons dividing said cylinders into first and second

chambers with said first chamber being on a first end of said piston and said second chamber being on a second end of said piston, said pistons each having a reduced diameter portion extending from said second end and through said second chamber, said pistons each having an exhaust passage longitudinally therethrough;

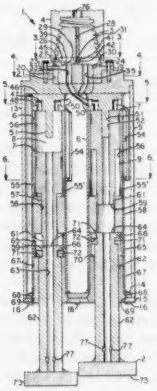
c. a pressure responsive valve in said housing;

d. a passage communicating with said valve for conducting pressurized air thereto;

e. passages communicating between said valve and said first and second chambers for selectively conducting pressurized air thereto for effecting reciprocating movement of said pistons within said cylinders;

f. drill bits mounted in said cylinders and having opposed ends with one end of each adjacent a portion of a respective said piston whereby movement of said piston on a power stroke urges said piston portion to engage a respective said drill bit end, said engagement being an impact type engagement, said drill bits each having an exhaust passage communicating between said cylinders and the exterior of said housing;

g. a member in each said cylinder selectively receivable in a respective piston exhaust passage for closing same until a predetermined position of the power stroke of said



piston is reach wherein said exhaust passage is opened for allowing pressurized air in said first chambers to be exhausted through respective said piston exhaust passages and respective said drill bit exhaust passages;

h. means forming an exhaust passage between said second chambers and said respective drill bit exhaust passages; and

i. means cooperating with said piston reduced diameter portion for closing said respective second chamber exhaust passages until a predetermined position of a return stroke of said pistons is reached wherein pressurized air is allowed to be exhausted from said second chambers into said respective drill bit exhaust passages.

3,870,114

DRILLING APPARATUS ESPECIALLY FOR GROUND DRILLING

Elgas Pulk, deceased, late of Uppsala, Sweden (by Carlgustaf Hallsenius, administrator), and John Paul Noren, Upplands Vasby, Sweden, assignors to Stabilator AB, Bromma, Sweden

Filed July 23, 1973, Ser. No. 381,556
Int. Cl. E21b 9/26
U.S. Cl. 175—258 **6 Claims**

1. Apparatus for drilling a hole in the ground along a center line comprising

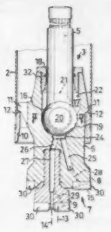
a casing pipe adapted to be disposed in the hole,

a drill unit received in said casing pipe and having an adaptor portion and a drill bit and a central axis parallel to and spaced from the center line of the hole,

driving means inside said casing pipe supplying torque and percussive force to said drill unit through said adaptor portion and along the central axis of said drill unit,

a generally cylindrical driving shoe attached to the end of said casing pipe and having on its inner side a supporting surface in the general form of a downwardly directed truncated cone, and

engaging means on said drill unit engaging the supporting surface of said driving shoe to pull said casing pipe into the hole without rotation as the hole is drilled,



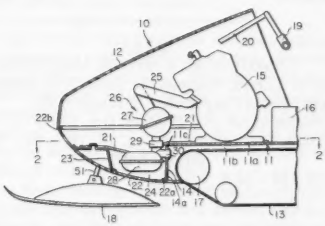
said drill bit including a ring bit with its center at the central axis of said drill unit and extending beyond said casing pipe to drill a hole wider than said casing pipe and a pilot bit extending from said ring bit with its center at the center line of the hole.

3,870,115

SNOWMOBILE EXHAUST ARRANGEMENT

Hideonori Hase, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-ken, Japan

Filed May 11, 1973, Ser. No. 359,334
Claims priority, application Japan, May 13, 1972, 47-55730
Int. Cl. B60k *13/06*
U.S. Cl. 180—5 R **3 Claims**



1. A snowmobile comprising:

an inverted channel shaped main frame having a top plate;

an endless track equipped under said main frame;

an internal combustion engine mounted on the front end portion of said top plate for driving said endless track;

a pair of front side plates connected with said main frame and projecting forwardly therefrom;

a main front plate extending downwardly from the front end of said main frame;

a forwardly progressively elevated front bottom plate fixed to the lower edges of said front side plates and having the rear end connected with the lower end of said main front plate, said front bottom plate having the shape of the hull of a vessel;

a first exhaust silencer connected with said engine; a second exhaust silencer connected with said first exhaust silencer and disposed in a well defined by said front side plates, main front plate and front bottom plate, thereby utilizing the space of said well; and

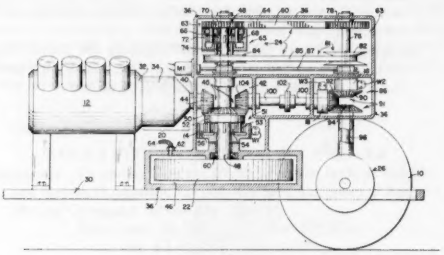
a stay positioned over said well for suspending said second exhaust silencer.

3,870,116

LOW POLLUTION AND FUEL CONSUMPTION FLYWHEEL DRIVE SYSTEM FOR MOTOR VEHICLES

Joseph Seliber, 313 Hibbard Rd., Wilmette, Ill. 60091

Filed Aug. 15, 1973, Ser. No. 388,637
Int. Cl. B60k 9/04
U.S. Cl. 180—54 k 8 Claims



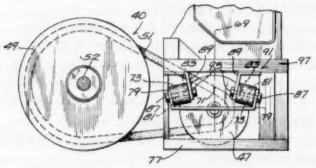
1. In an automotive vehicle, a hybrid vehicle propulsion system comprising a traction driving wheel, an energy-producing engine, a rotatable energy-storing flywheel, a first power train including a first variable speed power transmission, said first power train extending between said engine and flywheel, a second power train including a second and continuously variable speed transmission, said second power train extending between said flywheel and traction wheel, a third power train extending between said engine and traction wheel, a first clutch interposed in said first power train and effective when engaged to connect the first transmission to the flywheel in driving relationship for flywheel acceleration purposes, a second clutch interposed in said second power train and effective when engaged to connect the second transmission to the traction wheel in driving relationship, and a third clutch interposed in said third power train and effective when engaged to connect said first transmission to said traction wheel in driving relationship.

3,870,117

SNOWMOBILE MOTOR MOUNTING

Robert T. Larsen, Memomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 296,975, Oct. 12, 1972, Pat. No. 3,819,000. This application Aug. 10, 1973, Ser. No. 387,372
Int. Cl. B60k 5/04
U.S. Cl. 180—64 R 4 Claims



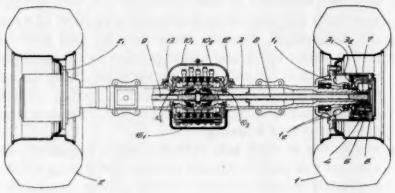
1. A snowmobile comprising a frame, an internal combustion engine including a crankshaft and two alternately firing cylinders, and a pair of resilient mounting means for supporting said engine from said frame at each end of said crankshaft with the axis of said crankshaft extending transversely of said frame and with the axis of said cylinders located in a generally vertical plane extending transversely of said frame and for providing relative softness in the vertical direction and relative stiffness in the direction transverse to the vertical direction and transverse to the crankshaft axis, whereby to minimize fore and aft crankshaft movement.

3,870,118

BRAKE ARRANGEMENT FOR VEHICLES

Hermann Klaue, 24, Tour D'Ivoire, 1820 Montreaux, Switzerland

Continuation-in-part of Ser. No. 190,615, Oct. 19, 1971, abandoned. This application Feb. 7, 1973, Ser. No. 330,432
Claims priority, application Germany, Oct. 26, 1970, 2052420; Switzerland, Feb. 10, 1972, 1932/72; Apr. 7, 1972, 5122/72; June 21, 1972, 9338/72
Int. Cl. B60t 5/00
U.S. Cl. 180—75 12 Claims



1. A vehicle brake arrangement, comprising in combination:

a vehicle provided with at least one pair of oppositely arranged non-driven wheels and an elongated hollow axle body fixed to the vehicle and extending between said wheels;

a liquid-cooled disc brake located in the axle body, said disc brake comprising a set of brake rings fixed against rotation but movable axially in the longitudinal direction of the axle body, said brake rings including liquid compartments, and including supply means for delivering liquid into said compartments and drain means for removing liquid therefrom, to thereby circulate cooling fluid therethrough;

a divided axle shaft located in the axle body and consisting of a left hand and a right hand part, each part having an inner end at the disc brake and an outer end connected one to each of said wheels, and each of said axle shaft parts being movable axially outwardly through the axle body;

at least one brake lamination having friction linings and removably fixed on the inner end of each of said axle shaft parts for rotation therewith, said brake laminations being located between said brake rings;

said axle body having an opening closed by a removable cover through which opening the braking assembly can be removed after the axle shaft parts have been pulled out axially beyond the braking assembly, and wherein the complete braking assembly including the brake rings is removable with the said compartments still containing the liquid coolant and operatively connected to said supply and drain means.

3,870,119

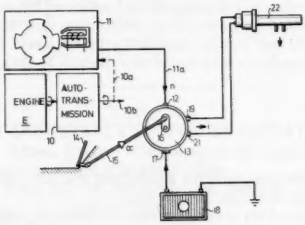
AUXILIARY BRAKE CONTROL FOR AUTOMOTIVE VEHICLES PARTICULARLY HAVING AUTOMATIC TRANSMISSIONS

Bert Wurst, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 5, 1973, Ser. No. 376,432
Claims priority, application Germany, July 27, 1972, 2236833
Int. Cl. B60l 7/12
U.S. Cl. 180—77 R 7 Claims

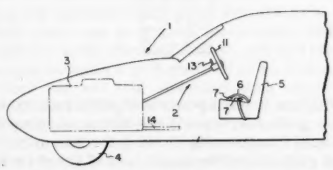
1. Auxiliary braking control apparatus for automotive vehicles, particularly having automatic transmissions, to derive a control signal indicative of

a. position of engine speed controller (14) and
b. vehicle motion,
comprising
a potentiometer (31) coupled to the engine speed controller (14) and changing slider position representative of engine speed controller position, the slider on the potentiometer (31) and the engine speed controller (14) being so connected that the output voltage from the slider of the potentiometer is essentially zero when the motor is controlled to operate at its idling speed condition, and increases proportionately as the motor speed controller (14) is operated to increase motor speed above idle, to provide an engine control electrical signal representative of position (α) of the engine speed controller (14);
a tachometer generator (11; FIGS. 6–11) having a rotating element mechanically coupled with the output from the



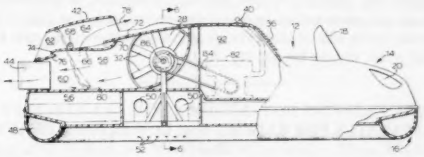
transmission of the automotive vehicle to provide a vehicle motion signal;
a difference amplifier (25) connected to the tachometer generator (11), said difference amplifier comparing the vehicle motion signal with a reference, and providing an output which is 0 when the vehicle motion signal representative of speed of a rotating element within the drive train is essentially 0, and further providing an output which is substantially different from 0 if the output of a rotating element coupled to the drive train is not 0, to provide a 0–1 binary type vehicle motion signal;
and logic means (13, 24) having said engine signal and said binary type motion signal applied thereto and providing a control output indicative of the logical conjunction of:
i. engine controller set to operate the engine at idling speed; and
ii. no vehicle motion.

3,870,120
VEHICLE GEAR SELECTOR CONTROL APPARATUS
Paul J. Blinkilde, Lathrup Village, Mich., assignor to Epsex International, Inc., Fort Wayne, Ind.
Filed Feb. 11, 1974, Ser. No. 441,351
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 C **11 Claims**



1. Apparatus adapted for use with a vehicle having transmission selector means shiftable between at least one drive mode and at least one non-drive mode, said apparatus comprising lock means movable between lock and unlock positions in which said selector means is respectively disabled from and enabled for movement from a non-drive mode to a drive mode; energizable and deenergizable magnetic drive means operable when energized to drive said lock means to said lock position; energizable and deenergizable magnetic holding means operable in response to energization of said drive means to hold said lock means in said lock position; means for energizing and deenergizing said drive means; and means for energizing and de-energizing said holding means, said means for deenergizing said holding means being independent of the means for de-energizing said drive means.

3,870,121
AIR CUSHION VEHICLE
Ralph W. Schneider, 15 Easterbrooke Ave., Willowdale, Ontario, Canada
Filed Dec. 4, 1972, Ser. No. 311,842
Int. Cl. B60v *1/14*
U.S. Cl. 180—117 **7 Claims**

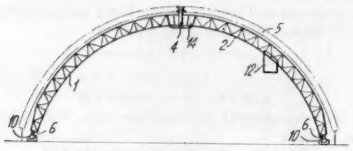


1. In an air cushion vehicle:
a rigid frame;
a power source driving first and second axial flow fans at a constant r.p.m. to deliver a substantially constant flow of air from the two fans during operation of the vehicle;
first duct means communicating with said first fan so as to direct a first flow of air therefrom to beneath said rigid frame;
second duct means communicating with said second fan so as to direct a second flow of air rearwardly therefrom to a thrust control means;
said thrust control means including:
at least one steering control vane;
forward and reverse thrust ducts in communication with each other, and a controllable valve means supported by said rigid frame and positioned downstream of said second duct means and relative to said second flow of air so as to control both the degree of communication between said forward and reverse thrust ducts and the amount of said second flow of air being directed to each of said forward and reverse thrust ducts;
and means for permitting a portion of said second flow of air to pass continuously over said at least one steering control vane; said forward thrust duct comprising a third duct means having said at least one steering control vane mounted therein, and a fourth duct means being located proximate to said third duct means and in communication, under the control of said controllable valve means, with said reverse thrust duct and said second duct means.

3,870,122
SERVICE DEVICE
Pierre Faucheux, Paris, France, assignor to Etablissement Fresa, Vaduz, Liechtenstein
Filed Jan. 24, 1973, Ser. No. 326,274
Claims priority, application Switzerland, Jan. 28, 1972, 1292/72
Int. Cl. E04g *3/14*
U.S. Cl. 182—36 **9 Claims**

1. A service device for a building including a generally dome shaped roof, said device comprising a track within said roof, pivot means fixed to the top of said roof and extending downwardly and inwardly thereof, at least one catwalk disposed within the interior of said roof and connected at its

upper end to said pivot means, said catwalk corresponding substantially to the curvature of said roof and comprising a metallic framework having an upper surface juxtaposed the interior surface of said roof, roller means carried by the lower end of said catwalk engaging said track to permit said lower



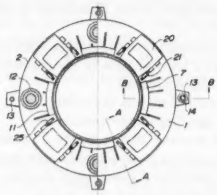
end of the catwalk to be movable therein, flooring means within the interior of said catwalk framework substantially from said pivot means to said roller means, a motor disposed at the lower end of said catwalk and said motor connected to said roller means for driving the same.

3,870,123

APPARATUS FOR RAISING AND LOWERING A HEAVY WEIGHT

Hitoshi Izumi, Yokohamashi, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed May 7, 1974, Ser. No. 467,780
Claims priority, application Japan, May 10, 1973, 48/51910
Int. Cl. E04g *3/02*
U.S. Cl. 182—136 **1 Claim**



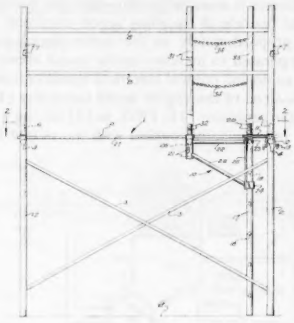
1. Apparatus for raising and lowering a heavy weight comprising a column, a floatable working platform adapted to be moved along said column, an upper outer ring surrounding said column, a lower outer ring surrounding said column and having a spaced distance from said upper outer ring, each of said outer rings having a tapered inner surface, a plurality of upper and lower wedges each of which has a tapered outer surface which may be engaged with the corresponding tapered surface of either of said outer rings, frames for holding said upper and lower wedges, several cylinders for operating said wedges, upper and lower inverted tapered blocks disposed on said upper and lower outer rings respectively, upper and lower inverted tapered wedges which may be engaged with the corresponding tapered surfaces of said inverted tapered blocks, frames for holding said upper and lower inverted wedges, cylinders for operating said upper and lower inverted wedges, guide means for moving said upper and lower inverted wedge holding frames in the direction parallel to the inverted tapered surface, main cylinders coupling said upper and lower outer rings and adapted to move said working platform and column, and tie rods passing through the upper and lower outer rings and connected to the working platform with the top end of said tie rod being projected, each said tie rod having means for preventing the upper outer ring from removing from the tie rod at the top end and having a step portion for receiving the lower outer ring.

3,870,124

SCAFFOLD LADDER STRUCTURE

Ivy J. Howard, 2020 Minda Drive, Eugene, Oreg. 97401

Filed Jan. 9, 1974, Ser. No. 432,081
Int. Cl. E04g *1/14*
U.S. Cl. 182—178 **7 Claims**



1. Ladder structure for attachment interiorly of a scaffold, said ladder structure comprising,

a ladder offset inwardly within the scaffold confines,

connector means extending intermediate a scaffold member and the upper end of the ladder securing the ladder against displacement, said connector means detachably mounting the ladder to said scaffold member, and

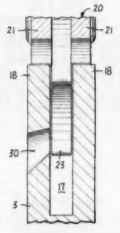
a framework in supported engagement with the upper end of said ladder and defining therewith an accessway for workers, said framework adapted to support guard rail posts of a protective enclosure above said accessway to prevent inadvertent entry by a worker on the scaffold work surface.

3,870,125

GUIDE BAR OILING SYSTEM FOR CHAIN SAW

Walter Gorski, Armonk, N.Y., assignor to Textron Inc.,, Providence, R.I.

Filed Feb. 2, 1973, Ser. No. 329,207
Int. Cl. F16n *7/16*
U.S. Cl. 184—15 R **15 Claims**



1. In a chain saw having a power head with a support surface to receive a guide bar, a guide bar having an inboard end portion, means for removably securing the inboard end portion of said guide bar to the power head of the chain saw in a position overlying said support surface, said guide bar having at its periphery two peripherally extending side flanges defining betweem them a peripherally extending groove, a saw chain running on said guide bar and comprising links having support surfaces sliding on outer edges of said side flanges to support the chain on the guide bar and links with tangs extend-

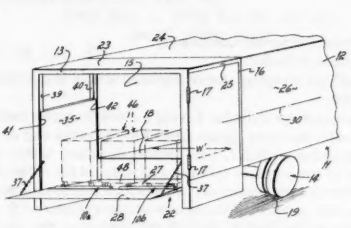
ing into said peripheral groove of the guide bar a distance less than the depth of said groove and slidably engageable with an area of the inner surface of each said side flange extending in from the outer edge of said flange a distance equal to the inward extent of said tangs, said guide bar having in its inboard end portion an oil hole extending through one said side flange and opening into said peripheral groove, the inner end of said oil hole opening in the inner face of the respective side flange wholly within the area thereof engageable by said tangs and the diameter of the inner end of said oil hole where it opens into the groove of the guide bar being between one thirty-second inch and one-eight inch, and means on said power head for supplying lubricating oil under pressure to said oil hole to lubricate said chain, including a recess in said supporting surface in position to communicate with said oil hole and an oil supply passage communicating with said recess, the cross sectional area of said oil hole varying within the thickness of the respective side flange so as to have a larger cross sectional area at the outer face of said side flange for communication with said recess than at the inner face of said side flange, said tangs sweeping the inner end of said oil hole to inhibit clogging of said oil hole by sawdust or other particles.

3,870,126

CART STOP STRUCTURE FOR AN ELEVATOR

William H. Himes, Dayton, Ohio, assignor to Leyman Manufacturing Corporation, Cincinnati, Ohio

Filed July 18, 1973, Ser. No. 380,170
Int. Cl. B60p *3/06*
U.S. Cl. 187—8.52 **9 Claims**



5. An elevator platform of a width adapted to hold a wheeled vehicle during up and down operation of said platform, said platform comprising

a chock bar permanently connected to a floor surface of said platform, said permanent connection permitting movement of said chock bar on a vertical hinge line between chocking attitude where said chock bar is located transverse to the travel path of said wheeled vehicle across said floor and a storage attitude where said chock bar is located parallel to the travel path of said wheeled vehicle, and said permanent connection comprising a hinge pin fixed to the underside of said chock bar, said hinge pin being received in permanent pivot relationship with said floor, primary latch means fixed to said chock bar, said primary latch means on said chock bar cooperating with secondary latch means in said floor to insure that said chock bar is retained in chocking attitude when disposed in the chocking attitude, and said primary latch means including a latch pin fixed to the underside of said chock bar and said secondary latch means including structure defining a hole in said floor, and

said latch pin and hinge pin each cooperating with a coller fixed to said floor, the diameter of said hinge and latch pins relative to the diameter of said collars providing a sloppiness of fit that allows said chock bar to be easily lifted out of chocking attitude and swung to storage attitude, and vice verse.

8. An elevator platform of a width adapted to hold a wheeled vehicle during up and down operation of said platform, said platform comprising

a chock plate connected to a floor surface of said platform along a hinged edge thereof, said plate being adapted to pivot on a horizontal axis between a storage attitude where same is angularly upraised with respect to said floor and disposed transverse to the travel path of said wheeled vehicle,

a latch plate hingedly connected adjacent the free edge of said chock plate, said latch plate being movable relative to said chock plate as said chock plate is pivoted between storage and chocking attitudes,

a well provided in said floor within which said latch plate is positioned when said chock plate is in the storage attitude, thereby permitting said chock plate to lie flush with said floor, and

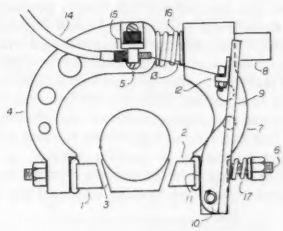
immobile ledge means fixed to one side wall of said well, said latch plate being provided with a center of gravity such that said latch plate pivots toward that side wall of said well which mounts said ledge means as said chock plate is raised, said latch plate being trapped on said ledge means upon lowering said chock plate after said latch plate has been raised sufficiently to clear said ledge means initially, thereby restraining said chock plate in an angularly upraised position.

3,870,127

VARIABLE-LEVERAGE BRAKES FOR BICYCLES AND THE LIKE

David G. Wilson, 42 Winston St., Cambridge, Mass. 02138; Brian D. Hanson, 5101 Park Rd. Apt. 106, Charlotte, N.C. 28209, and John M. Malarkey, 328 Marlborough St., Boston, Mass. 02215

Filed June 14, 1972, Ser. No. 262,457
Int. Cl. B62l *1/00*
U.S. Cl. 188—24 **3 Claims**



1. A braking mechanisms for bicycle wheels and the like, comprising a pair of caliper elements each carrying a respective brake block;

one such caliper element being carried by the other caliper element and having relative movement thereon; and means predetermining an initial braking force whereby said one caliper element has said relative movement to a limiting position responsive to said brake blocks having initial wheel engagement for braking thereof with said initial predetermined braking force;

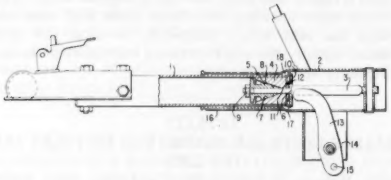
manually operable means for effecting relative movement of said caliper elements to effect said initial wheel engagement;

a lever carried by said one caliper element and securing means providing relative movement with respect thereto; said manually operable means being attached to said lever to effect said initial relative movement of said caliper elements and respective brake blocks to effect wheel engagement;

said means predetermining an initial braking force comprising a movable mount means for the respective brake block of said one caliper element for subsequent movement of said brake block after said initial engagement to

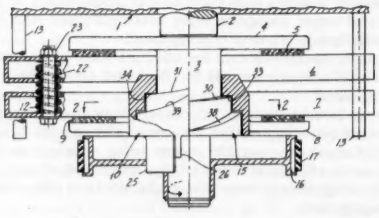
effect increased braking pressure upon continued operation of said manually operable means;
and drive means whereby said lever effects movement of said latter brake block to effect said increased braking pressure.

3,870,128
OVERRUNNING BRAKE FOR TRAILERS
Heinz Nicolay, and Hans Gruner, both of Heidelberg, Germany, assignors to Graubremse GmbH, Heidelberg, Germany
Filed Oct. 25, 1972, Ser. No. 300,747
Claims priority, application Germany, Oct. 25, 1971, 2152993
Int. Cl. B60t 7/20
U.S. Cl. 188—112 **10 Claims**



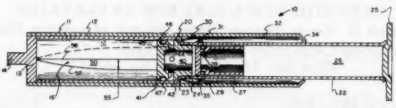
1. An overrunning brake for a trailer, said brake comprising a first pull member displaceably mounted in a second pull member, power transmission means coupled to the first pull member for acting on the brake, and shock absorbing means positioned between the first and second pull members for absorbing shocks and vibrations, said shock absorbing means including a mechanically operating friction member positioned in the second pull member and prestressed for displacement between first and second lugs fixedly positioned in and attached to the second pull member, said friction member being operatively coupled to the second pull member and having a friction face forced against the first pull member, and said first pull member being provided with a third lug adapted for movement to a position between the first and second lugs so as to shorten the displacement of the friction member between the first and second lugs during starting action of the trailer and for movement to another position so as not to shorten the displacement of the friction member between the first and second lugs during braking action of the trailer.

3,870,129
LOAD BRAKE
Carter H. Arnold, 317 Rocky Point Rd., Palos Verdes Estates, Calif. 90274
Filed Mar. 20, 1972, Ser. No. 236,086
Int. Cl. B60t 7/12
U.S. Cl. 188—134 **29 Claims**



1. In a brake structure that includes a pair of brake plates and further includes a pair of brake shoes adapted to engage the opposite outer faces of said plates,
resilient means for urging said plates apart with a predetermined force when said brake is disengaged,
a cam member,
first camming means on said member for causing said plates to move apart a predetermined amount upon movement of said cam member a certain distance in one direction,
second camming means on said member for restoring said resilient means to apply said predetermined force upon said movement of said cam member said certain distance,
whereby said plates are moved apart to compensate for wear of said brake shoes while the force of said resilient means remains the same.

3,870,130
SHOCK ABSORBER
Gerald R. Miller, Hillsburgh, Ontario, Canada, assignor to Gabriel of Canada Limited, Hillsburgh, Ontario, Canada
Filed Apr. 9, 1973, Ser. No. 349,565
Claims priority, application Canada, May 15, 1972, 142077
Int. Cl. F16f 9/48
U.S. Cl. 188—288 **1 Claim**

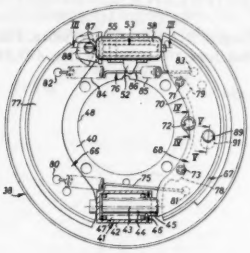


1. An impact absorber comprising:
a. a pressure cylinder;
b. an orificed metering sleeve disposed within the pressure cylinder;
c. an accumulator cylinder having a closure at one end;
d. a movable damping piston affixed to the other end of the accumulator cylinder, the piston, disposed within the sleeve of the pressure cylinder and adapted for reciprocation therein, the piston including orifice means communicating the interior of the accumulator cylinder with the interior of the sleeve through the orifice of the sleeve, irrespective of the position of the piston within the sleeve;
e. a floating piston located within the accumulator cylinder;
f. a thixotropic fluid disposed in the sleeve whereby impact on the accumulator cylinder causes the thixotropic fluid to flow through the orifice of the absorber to present an essentially constant retarding force against the impact.

3,870,131
INTERNAL SHOE DRUM BRAKES
Anthony Christopher Firth, and Robin Edward Child, both of Leamington Spa, England, assignors to Automotive Products Company Limited, Leamington Spa, England
Filed June 25, 1973, Ser. No. 373,275
Int. Cl. F16d 51/22
U.S. Cl. 188—325 **4 Claims**

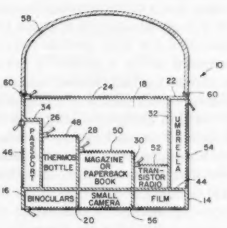
1. An internal shoe drum brake comprising a pair of arcuate brake shoes, a shoe expanding device adjacent one end of the shoes to urge the brakes into contact with a brake drum, a carrier member for one brake shoe comprising substantially parallel spaced arcuate plates, rivet means holding said one brake plate in said spaced relationship, said one brake shoe having its web projecting radially into the space between said plates and being circumferentially movable between said spaced plates, a fixed abutment member disposed adjacent the opposite end of said brake shoes, pin means extending through openings in said spaced plates and an enlarged opening in said one brake plate with said enlarged opening extending in a direction permitting movement of said one plate when it is

desired to brake in one direction, and abutment means adjacent the opposite end of said one brake shoe to contact it



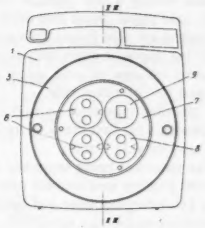
when said shoe expanding device is operated for parking and the brake drums tends to rotate in the opposite direction.

3,870,132
PORTABLE TRAVEL BAG
Hanley, John J., Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.
Filed Mar. 1, 1974, Ser. No. 447,231
Int. Cl. A45c *11/00*
U.S. Cl. 190—52 **3 Claims**



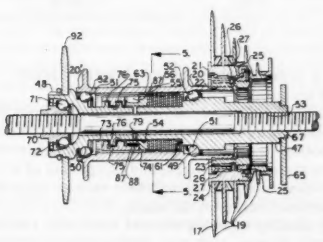
1. A travel bag comprising front and rear walls; opposed side walls; top and bottom walls forming a sack; a plurality of horizontal and vertical partitions in said sack; a horizontal shelf extending between said end walls spaced above said bottom wall and defining bottom compartments with some of said partitions and said bottom wall; and a zipper extending along said bottom wall to close said bottom compartments; a plurality of inner compartments formed by said horizontal and vertical partitions and said shelf, a zipper closing the top of each of said inner compartments; a pair of outer vertical compartments on either side of said inner compartments, one of said compartments being defined by a part of said top wall, said shelf, one of said vertical partitions and said side wall; said one compartment having a vertical zipper for closing same; said other outer compartment being defined at its top by one of said horizontal partitions, at its bottom by said shelf and at its sides by one of said side walls and by one of said vertical partitions, a vertical zipper for closing said other compartment; a horizontal zipper extending substantially the length of said sack in said top wall for gaining access to said inner compartments and a handle extending above said top wall and secured to the top of said side walls.

3,870,133
CABLE DRUMS
Hugo Brennenstuhl, Seestr. 1-3, Tubingen-Prondorf, Germany
Filed Sept. 10, 1973, Ser. No. 395,555
Claims priority, application Germany, Sept. 10, 1972, 7233401[U]
Int. Cl. H02g *11/00*
U.S. Cl. 191—12.2 R **13 Claims**



1. A cable urum, particularly for household, workshops, building sites and the like, comprising a carrier, a drum body for taking an extension cable containing a cylindrical part with a first and second end wall on its axial ends and with a plug base having at least one socket connected electrically with an extension cable in which the drum body has a holder and a lamp and a switch for the electrical connection between the lamp and the extension cable, and in which the switch is arranged in the region of the plug base on the first end wall and the holder and lamp is placed in a central opening in the second end wall opposite to the first end wall.

3,870,134
BRAKE AND MULTI-SPEED DRIVE FOR A BICYCLE
Joseph L. Anthamatten, Precious Blood Seminary, Ruth Ewing Rd., Liberty, Mo. 64068
Filed May 13, 1974, Ser. No. 469,238
Int. Cl. F16d *67/02*
U.S. Cl. 192—6 A **6 Claims**



1. A drive and braking apparatus for multi-speed bicycles comprising:

a. an axle;

b. a hub rotatably mounted on said axle, said hub having first and second ends;

c. a multi-stage sprocket assembly mounted on said hub adjacent said first end and having a clutch operatively connecting same and said hub for selectively driving said hub in one direction, said clutch being mounted on said hub on the exterior thereof and having said multi-stage sprocket thereon;

d. brake means between the axle and said hub, said brake means including a plurality of brake members;

e. actuator means mounted on said axle and operatively associated with said brake means, said actuator means

having a portion rotatable in a direction opposite to said one direction;

f. a pedal crank and drive sprocket;

g. a drive chain operably connecting said drive sprocket and multi-stage sprocket assembly;

h. means operably connecting said actuator means rotatable portion to said pedal crank whereby rotation of said pedal crank rotates said rotatable portion in said opposite direction and actuates said brake means;

i. a bicycle frame having a rear portion with said axle secured thereto, said pedal crank and drive sprocket being rotatably mounted on said frame forwardly of said axle, said frame having opposite sides with said drive sprocket being positioned on one of said sides and said means being positioned on the other side;

j. a first brake sprocket mounted on said pedal crank and rotatable therewith, said first brake sprocket being on the other side of said bicycle frame;

k. a second brake sprocket being mounted on said actuator means rotatable portion said second end;

l. A brake chain extending between and operably connected to said first and second brake sprockets;

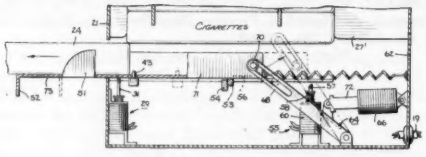
m. an arm operatively connected to said brake means and positioned on the exterior of said hub adjacent said one end and having one end secured to a portion of said bicycle frame, said arm preventing relative rotation between said axle and certain of said brake members.

3,870,135

CIGARETTE CARTON DISPENSING SYSTEM

Corey M. Allen, Mamaroneck, N.Y., assignor to Carton Sales, Inc., Mammaroneck, N.Y.

Continuation of Ser. No. 125,174, March 17, 1971, abandoned. This application Dec. 15, 1972, Ser. No. 315,407
Int. Cl. G07f 7/00
U.S. Cl. 194—4 **8 Claims**



1. In a system for dispensing cigarette cartons a vending machine comprising

a housing of modular construction having a floor therein for supporting a stack of cigarette cartons thereon, a door for exposing the interior thereof for replenishment of cigarette cartons to the stack, and an opening of a size corresponding to one of the cigarette cartons aligned with the lowermost carton of the stack;

a tray slidably mounted on said floor with the lowermost carton therein, said tray having a tab exposed to the exterior of said housing and a pair of slots therein;

gate means adjacent said opening of said housing including a gate plate disposed between said opening and the lowermost carton of the stack to pass through one of said slots in said tray to block the passage of the lowermost carton through said opening, and means for retracting said gate plate from said tray;

a lock mounted below said tray and having a plate to pass through the other of said slots in said tray and means for retracting said plate from said tray; and

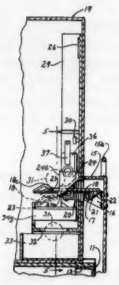
retraction means mounted to the rear of said housing and including a yoke pivotally mounted in said housing with a pair of arms having elongated grooves therein, a solenoid pivotally mounted in said housing and having a reciprocally mounted piston hingedly secured to said yoke, and cams on said tray disposed in said grooves of said arms to permit said tray to be retracted into said housing upon retraction of said piston into said solenoid.

3,870,136

COIN-OPERATED LATCH MECHANISM WITH COIN RETURN MEANS

Henry Carl Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed June 10, 1974, Ser. No. 477,585
Int. Cl. G07f 5/00
U.S. Cl. 194—54 **11 Claims**



1. A latch mechanism for use in a coin-operated dispensing device including a cabinet having a cooperative opening to provide access to said cabinet, closure means to selectively close said opening, and a coin-operated mechanism actuatable upon receipt of at least one coin of selected value, comprising:

a. a latch mounted for both pivotal movement about and axial movement along a generally horizontal long axis of an axle carried by said closure menas;

b. first yieldable means yieldably uring said latch toward a first axial position along said long axis of said axle;

c. a strike mounted on said cabinet and having a first portion releasably engageable in an aperture provided in said latch when said closure means is located in a position closing said opening;

d. a coin-receiving member mounted on said cabinet so as to trap a coin received therein generally vertically with its edge located atop a cam section provided on said latch and with one of the coin sides located contiguously to a second portion of said strike and thus to pivot said latch about said long axis of said latch axle against the yieldable urging of second yieldable means and disengage said aperture from said strike upon attempted removal of said closure means from a position closing said opening and to then discharge said coin into a coin-collecting receptacle; and

e. coin-return means including retractable plunger means mounted on said cabinet for movement along a second axis generally parallel to said long axis of said latch axle,

f. said plunger means having a first end protruding from the exterior of said cabinet and a second end being engageable with said latch and said coin-receiving member by movement of said first end towards the interior of said cabinet to cause said latch to overcome said yieldable urging of said first yieldable means and be moved axially along said long axis of said latch axle to a second position and, thus, to cause said coin to be released from said coin-receiving member and to be diverted by said second portion of said strike into a coin-return opening extending through an outer wall of said cabinet, rather than into said coin-collecting receptacle.

3,870,137
METHOD AND APPARATUS FOR COIN SELECTION UTILIZING INDUCTIVE SENSORS

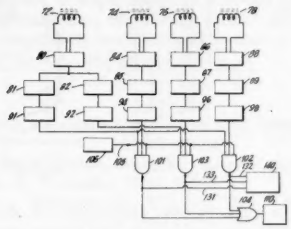
Guy L. Fougere, Lincoln, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 255,814, May 22, 1972, abandoned. This application Oct. 12, 1973, Ser. No. 405,881

Claims priority, application Great Britain, Feb. 25, 1972, 8385/72

Int. Cl. G07f *3/02*

U.S. Cl. 194—100 A **60 Claims**



1. A method for examining conductive coins with respect to both their authenticity and their denomination within a set of acceptable coins of various denominations comprising the steps of generating a first electromagnetic field of a low frequency range, subjecting the coin to the first field, generating a second electromagnetic field of a substantially higher frequency range than that of the first field, subjecting the coin to the second field, producing signals indicative of the degree of interaction of the coin with each field, and producing a signal indicative of the acceptability of the coin and selective of its denomination within the set only if the degree of each interaction is within predetermined tolerances of those of acceptable coins of one of the denominations of the set.

3,870,138
MOTOR CONTROL UNIT FOR TABLE-TYPE ELECTRONIC CALCULATOR WITH PRINTER

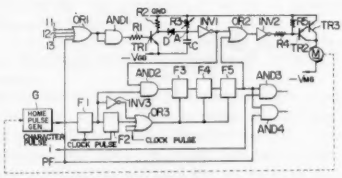
Yostbumi Sato, and Masaaki Ogura, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed July 13, 1973, Ser. No. 378,803

Claims priority, application Japan, July 17, 1972, 47-84230

Int. Cl. B41j *23/08*

U.S. Cl. 197—17 **4 Claims**



1. A motor control unit for a table-type electronic calculator with a printer and a keyboard providing character pulse trains in response to the operation of a keyboard key, said unit comprising: an integrating circuit including a capacitor which is discharged by a signal produced in response to the operation of a key on the keyboard and means for charging the capacitor at a defined rate, an electric motor for driving the printer, a drive circuit rendered conductive upon discharge of the capacitor for starting the motor, means for providing a home pulse for each revolution of the motor and a clock pulse train upon the operation of a keyboard key, a control circuit including means for providing an output signal in response to a defined home pulse and a clock pulse train and means for allowing the passage of said character pulse train to the printer during said output signal, said printer including means responding to the output signal from the control circuit to start a printing operation, means for resetting the control circuit upon the charging of the capacitor in the absence of an operation of the key, and means for interrupting the drive circuit to thereby stop the motor in response to said resetting of the control circuit.

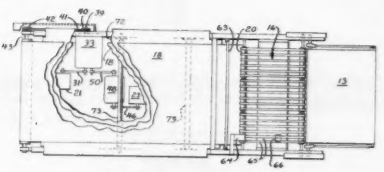
3,870,139
SHINGLING APPARATUS FOR FOOD ITEMS

Richard C. Wagner, c/o Integral Process Systems, Inc., 70 North St., Park Forest, Ill. 60466

Filed July 27, 1973, Ser. No. 383,340

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **7 Claims**



1. Apparatus for shingling stackable food items in spaced successive groups of a predetermined plurality of items in each group, comprising: feed means for supplying said items in at least one row; a light permeable transfer conveyor arranged to receive said items from said feed means and space the items apart a distance greater than the corresponding spacing of said items on said feed means; a shingling conveyor adjacent to said transfer conveyor receiving said items therefrom; first speed control means for periodically operating said shingling conveyor at a speed less than said transfer conveyor as an aid in assembling said items in groups in which successive items in each group have overlapped edges; second speed control means for periodically operating said shingling conveyor at a speed greater than said transfer conveyor at the conclusion of the assembling of each group to separate from each other successive said groups; and a photoelectric switch means for projecting a light beam through said conveyor, said light beam being interrupted by said items for operating said second speed control means at said conclusion of a preselected number of interruptions equivalent to a said group.

3,870,140
FEEDING DEVICE FOR A CARTON FORMING MACHINE

Louis Wieser, Ecublens, Switzerland, assignor to J. Bobst & Fils SA, Prilly, Switzerland

Filed Jan. 23, 1973, Ser. No. 326,070

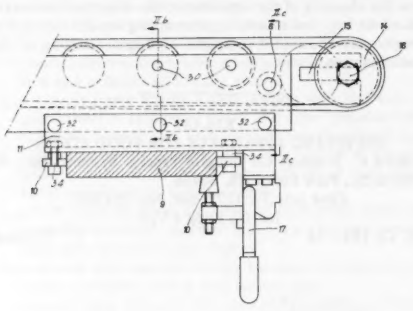
Claims priority, application Switzerland, Jan. 25, 1972, 1093/72

Int. Cl. B65g *15/12*

U.S. Cl. 198—190 **5 Claims**

1. In conveyor apparatus having a plurality of endless conveyor belts mounted in side-by-side relationship with the upper reaches of said belts defining a horizontal surface, the combination comprising: a separate supporting carriage for one of said conveyor belts, said carriage comprising first and second walls fixed in relationship to each other, a plurality of pulleys extending between said side walls for supporting one of said belts therebetween, means for supporting said first side wall for horizontal sliding movement away from an adjacent conveyor belt, said second side wall being supported by said first side wall and having a perimeter less than the perimeter

of said belt, whereby said belt may be removed by being slipped from said pulleys and over said second side wall, and

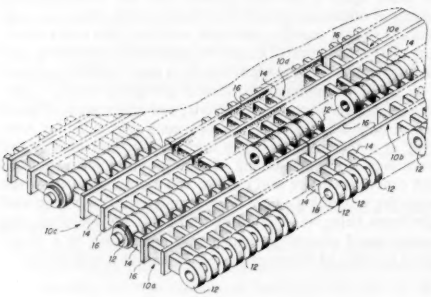


means for driving said conveyor belts including a detachable drive connection.

3,870,141
MODULAR BELT

James M. Lapeyre, and Fernand S. Lapeyre, both of New Orleans, La., assignors to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 63,523, Aug. 13, 1970. This application Oct. 8, 1971, Ser. No. 187,746
Int. Cl. B65g *15/32*
U.S. Cl. 198—193 **28 Claims**



1. A module for constructing linked structures, said module comprising, in combination:

a first plurality of link ends of substantially identical width, each being formed to circumscribe a pivotal hole, said holes of said first plurality being arranged coaxially;

a second like plurality of link ends of substantially indentical width, each being formed to circumscribe a pivotal hole, said holes of said second plurality being arranged coaxially, the axes of respective holes of both pluralities of link ends being substantially parallel; and

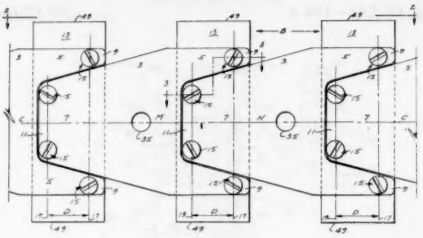
a plurality of spaced apart elongated members each integrally formed with and joining a pair of corresponding link ends of said first and second pluralities, said members being joined by at least one cross rib also formed integrally therewith and extending parallel to said axes;

said link ends being dimensioned and spaced apart by a distance slightly greater than said width so that said module is end-to-end reversible, so that a plurality of said modules may be engaged with each other at said ends.

3,870,142
FLEXIBLE BELT CARRIER MECHANISM

Duane W. Woltjen, Manchester, Mo., assignor to UMC Industries, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 286,141, Sept. 5, 1972, which is a continuation of Ser. No. 884,511, Dec. 12, 1969, abandoned. This application Feb. 20, 1974, Ser. No. 444,060
Int. Cl. B65g *15/30*
U.S. Cl. 198—193 **16 Claims**

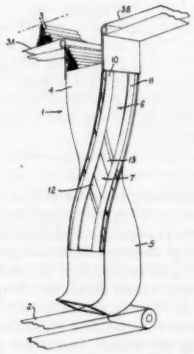


14. A flexible belt comprising at least one pair of adjacent portions, at least one extension from each portion, said extension from the first portion projecting opposite the extension from the other portion so as to obtain lapping of said extensions in the direction of the belt length, a connector, fastening means securing said connector to each extension, the location where one fastening means securing the first extension to the connector being at a location in the area of lapping and spaced beyond the location where another fastening means secures the other extension to said connector, whereby in an arcuate form of the belt said connector maintains said extensions substantially in a plane outside of and tangent to said arcuate form, thereby to avoid bending of the extensions proximate the location of their fastening to said connector.

3,870,143
FEEDING CIGARETTES

Frank Heybourn, and Dennis Hinchcliffe, both of London, England, assignors to Molins Limited, Deftsford, London, England

Filed Oct. 31, 1972, Ser. No. 302,401
Claims priority, application Great Britain, Mar. 1, 1972, 9444
Int. Cl. B65g *11/06*
U.S. Cl. 198—280 **6 Claims**



1. A twisted chute for feeding vertically downwards a stack of cigarettes, comprising two twisted parallel end walls arranged on opposite sides of a vertical rectilinear axis and

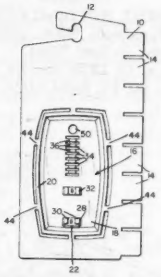
equidistant therefrom and being spaced from each other by a distance substantially equal to the length of a cigarette, each of the said end walls extending across substantially the whole width of the said stack and arranged to restrict endwise movement of the cigarettes in the said stack, and two twisted parallel side walls which are arranged to lie on opposite sides of the said stack and to contact and guide the outer layers of cigarettes in the stack so as to progressively rotate the stack about the said axis as the stack is fed down the chute, the two side walls being substantially equally spaced from the said axis along their lengths; said side walls and end walls defining a downwardly extending channel of rectangular cross section of sufficient size to accommodate at least two cigarettes, each side wall comprising two narrow parallel strips adapted to engage respectively near the opposite ends of the cigarettes forming the outer layers of the stack.

3,870,144

DISPLAY CARD AND FRANGIBLY SEPARABLE CONTAINER

Henry Lloyd Hanson, Henry L. Hanson Company, Inc., 25 Union St., Worcester, Mass. 01608

Filed June 28, 1973, Ser. No. 374,668
Int. Cl. B65d *25/10, 73/00*
U.S. Cl. 206—45.14 **5 Claims**



1. A display and inventory card for merchandise comprising a relatively flat sheet of material, hanger means thereon, an opening in the sheet,

a merchandise container mounted in said opening,

tabs on the card extending into the opening, said tabs being connected to the container, said tabs being easily broken to separate the container from the display card,

a bottom for the container, a series of mutually spaced frangible fingers in alignment extending from the bottom of said container, said fingers being disruptable according to the length of the merchandise to be held in the container,

wherein the merchandise is a tool having a shank and said container including snap-in means for holding the shank of the tool, and an abutment for the end of the shank of the tool, the other end of the tool held in the container also substantially abutting one of the fingers.

3,870,145

TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed May 17, 1972, Ser. No. 254,054
Int. Cl. B44d *1/46;* **B05c** *11/12;* **E01b** *29/04;* **F26b** *3/00*
U.S. Cl. 206—84 **8 Claims**

1. An article of manufacture comprising:

a. an impregnated sponge having an average pore size of 0.05 to 4 millimeters which has been impregnated from its surface into its interior with about 0.3 to about 0.7 gram, per cubic centimeter of unimpregnated sponge, of a heatsoftenable fabric conditioning agent comprising a quaternary ammonium salt, said fabric conditioning agent having a softening point range of at least 10 C. ° being softened within the range of 50° to 90°C.; and

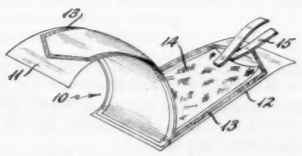
b. attaching means operably associated with said impregnated sponge for attaching the impregnated sponge to a wall of a machine dryer.

3,870,146

WRIGHT'S STAIN PACKET

Walter Greenfield, Ardlsey, and Raymond Berg, Scarsdale, both of N.Y., assignors to Sci-Med Laboratories, Inc., Hartsdale, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,456
Int. Cl. B65d *81/00*
U.S. Cl. 206—84 **3 Claims**



1. A Wright's Stain packet which comprises a single use air and liquid impermeable package containing therein a microscope slide sized pad impregnated with a buffered methanolic solution of Wright's Stain.

3,870,147

CONTAINER FOR STORAGE AND PREPARATION OF A PLANT PROTECTIVE MATERIAL CONTAINING AT LEAST TWO COMPONENTS

Gunther Orth, Birken, Germany, assignor to Wolf-Gerate GmbH, Belzdorf, Sieg, Germany

Filed Apr. 19, 1973, Ser. No. 352,508
Claims priority, application Germany, Apr. 28, 1972, 2221101
Int. Cl. B65d *25/08, 1/04*
U.S. Cl. 206—222 **7 Claims**

1. Container means for separate storing and for mixing at least two components, one a dissolving component and another a solvent; said container means comprising:

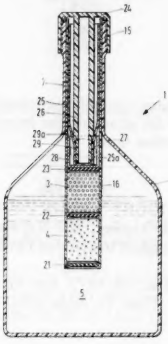
a container for containing one component; said container having a body, an opening into said body and a neck leading from said body to said container opening;

a capsule for containing the other component and being positioned to extend into said container body; said capsule having sidewalls, a normally sealed openable base, a normally sealed first stopper spaced away from and above

said base along said sidewalls, whereby said capsule is sealed closed

a removable second stopper for closing said body opening; affixed to said second stopper and normally positioned in and extending into said neck toward said first stopper is an operating sleeve of a first length for operating a capsule rammer; said sleeve having a first free end portion that is away from its said second stopper and which is shaped to define a first abutment to abut the capsule rammer;

also normally positioned in said neck and extending along at least part of the length of said sleeve is a removable capsule rammer; said rammer having a second end portion that is shaped to define a second abutment to abut said first abutment; said rammer having a rammer end opposite its said second end portion; said rammer end in the said normal position of said rammer extending up



through said neck toward said second stopper and away from said capsule; with both said sleeve and said rammer in their respective said normal positions, said first and said second abutments are separated and are out of engagement with each other;

upon removal of said rammer from said container neck, inversion of said rammer and replacement of said rammer in said neck in the inverted position such that said rammer end extends into said container and said rammer second end portion extends toward said second stopper, and upon moving of said second stopper and its said sleeve onto said container neck toward said container body, said first and said second abutments abut; said rammer being of a length such that its said rammer end engages and breaks through both said capsule first stopper and said capsule base, thereby causing mixing of the components in said capsule and said container.

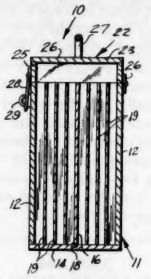
3,870,148

CIRCULAR SAW BLADE CONVEYANCE BOX

Harold H. Hite, Rd.-2-Co. Rd.-40, Pataskala, Ohio 43062

Filed Feb. 7, 1973, Ser. No. 330,269
Int. Cl. B65d *25/04, 85/54*
U.S. Cl. 206—372 **1 Claim**

1. A circular saw blade conveyance box, comprising a rectangular container for the storage of a plurality of circular saw blades, a pair of parallel spaced apart side walls, a pair of parallel spaced apart end walls and a bottom wall carried by said container defining compartment means for a plurality of inserts, a central separator wall carried within said container serving to provide two compartments within said container, a plurality of circular saw blades in each compartment, a plurality of self-supporting inserts loosely received in said compartments and unconnected to said container, each insert being of substantial thickness and located intermediate two adjacent blades for spacing said blades, said partition and said inserts having a height less than the height of said saw blades for facilitating visual observation and grasping of the blades, a



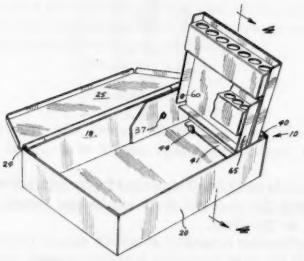
rectangular cover carried by said container, with handle grip means and fastener means for locking said container and hinge means carried by said container and said cover for rendering said cover hingeable thereto.

3,870,149

DRILL HOLDING CASE

William J. Huot, Mahtomedi, Minn., assignor to Huot Manufacturing Company, St. Paul, Minn.

Filed Apr. 23, 1973, Ser. No. 353,408
Int. Cl. B65d *85/20*
U.S. Cl. 206—379 **1 Claim**



1. A drill holding case structure having in combination

a housing having a bottom wall and upstanding end and side walls,

a substantially U-shaped plate member comprising an end wall and forwardly extending side walls forming an insert member,

projecting inwardly of said side walls are aligned pairs of collars,

means removably securing said insert member within said housing,

a drill holding member comprising a back wall and projecting side walls,

a pair of aligned outwardly extending projections adjacent the bottoms of said side walls received within a pair of said aligned projecting collars of said insert member, whereby said insert member has said drill holding member pivotally disposed therein and is then disposed within said housing,

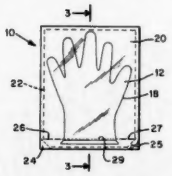
a flange projecting from the bottom of the end wall of said insert member, and

a tongue struck from said bottom wall of said housing engages said projecting flange removably securing said insert member.

3,870,150
STERILE PLASTIC GLOVE AND PACKAGE ASSEMBLY

John Hummel, Tulsa, Okla., assignor to Poly-Version, Inc., Tulsa, Okla.

Filed May 24, 1973, Ser. No. 363,570
Int. Cl. B65d 85/18; A61b 19/02
U.S. Cl. 206—438 10 Claims



1. A disposable, sterile article of manufacture and a disposable container therefor comprising, in combination:

a. a flexible support member;

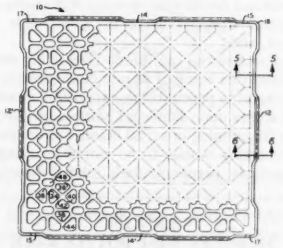
b. a plastic film glove having closed fingers and an open wrist portion defining a peripheral edge, said glove being positioned on said support member prior to said glove being used so as to permit removal of the glove from the support member by mechanically pulling without damaging the glove; and

c. a plastic film sheath superimposed over said glove and secured to said support member along a primary seal line completely surrounding and spaced from the peripheral edge of said glove whereby said glove is sealed in a sterile condition, said sheath and said support member, in combination, defining an initially sealed, internally sterile container for said glove, said container having an openable end for receiving the glove after its removal and use whereby said container may be discarded together with said glove therein.

3,870,151
TRAY

Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 30, 1973, Ser. No. 383,720
Int. Cl. B65d 21/04, 1/22
U.S. Cl. 206—507 14 Claims



1. A tray comprising:

a pair of upstanding opposed first walls;

a pair of upstanding opposed second walls, having a length greater than said first walls, joined to said first walls along the upstanding edges thereof;

said second walls having a height, substantially along the full length thereof, which is less than the height of said first walls for permitting cross-nesting of an upper tray in a like lower tray between the higher first walls thereof;

a bottom panel joined to the lower end portions of said first and said second walls to provide a generally rectangular open top structure;

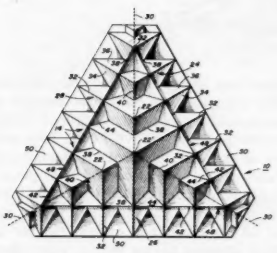
a generally flat wall means formed in each end portion of, and recessed inwardly from a nonrecessed portion of, each of said second walls; and

an outwardly extending shoulder formed in each of said second walls at each junction of a said flat wall means and a said nonrecessed portion of said second walls for, together with said flat wall means, interlocking said second walls of an upper tray with said first walls of a like lower tray when an upper tray is cross-nested in a like lower tray.

3,870,152
LOAD BEARING DEVICE

Paul N. Kaplan, Livingston, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 7, 1973, Ser. No. 367,763
Int. Cl. B65d 81/02
U.S. Cl. 206—523 17 Claims



1. A load bearing device for protectively packaging articles inserted therein formed of moldable plastic and comprising a plurality of fluted elements forming

a peripheral outer surface and

an undulating inner surface of said load bearing device,

said outer surface having a pyramidical envelope geometrical contour,

said pyramidical contour envelope forming a triangular pyramid envelope having three contiguous faces defining said inner and outer surfaces of said load bearing device, each of said fluted elements passing to an apex defining an intersection between adjacent faces of said pyramidical contour envelope, a pair of fluted elements on adjacent faces of said pyramidical contour envelope forming a common apex on said intersection line between said adjacent faces,

said fluted element apices forming a monotonically increasing positional location along said intersecting line from a base plane of said load bearing device to a geometrical centroidally located apex of said pyramid envelope,

said fluted elements on each of said faces of said load bearing device being defined by a pair of walls interfacing at a load bearing ridge extending substantially parallel each to the other.

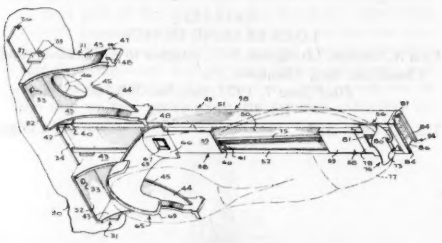
3,870,153
SHOE MERCHANDIZING AND HANDLING SYSTEM

Ivor J. Allsop; Jon I. Allsop; Michael G. Allsop, and James D. Allsop, all of P.O. Box 23, Bellingham, Wash. 98225

Filed Apr. 30, 1973, Ser. No. 355,698
Int. Cl. A47f 7/08
U.S. Cl. 211—37 2 Claims

1. In a shoe merchandizing and handling system, a support member, a plurality of spaced apart brackets affixed to said support member and each bracket including a base portion, first and second members extending from said base portion, a flange extending from said first member and having a lug thereon, a flanged member extending from said second mem-

ber and having a lug thereon, the brackets including flanges having spaced apart lugs thereon, a web between the flanges of the brackets; a bar mounted between adjacent brackets and each bar including a flat section and channel portions thereon for engagement by the lugs of the brackets, a locking means for retaining the bar in place between the brackets, said locking means including an opening in an end portion of the bar for selectively receiving a lug on one of the members projecting from the bracket; shoe holding means operatively connected to each bar and each shoe holding means comprising



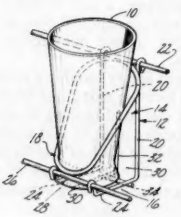
a pair of similar base elements, said base elements having portions slidably engaging said bar, there being a groove in each base element, a heel piece and a toe piece having a finger engaging the corresponding groove in the base element, L-shaped keepers on said base element for engaging grooves in the outer surfaces of the heel piece and base piece, resilient means operatively connecting said pair of base elements together; there being a slot in the outer end of the bar, an end piece mounted on the outer end of said bar for selectively engaging the base element having the toe piece thereon, and said end piece having indicia therein.

3,870,154

DISPLAY APPARATUS

John E. Monet, Birmingham, and Fredrick Brunette, Farmington, both of Mich., assignors to John E. Monet, Birmingham, Mich.

Filed Apr. 23, 1973, Ser. No. 353,349
Int. Cl. A47b *73/00*
U.S. Cl. 211—74 **5 Claims**



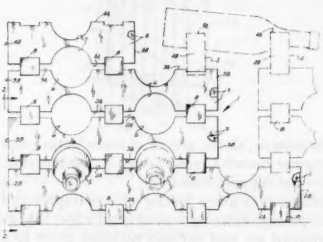
1. In combination with a number of vases each having an enlarged lower lip portion, a display device for holding in place vases in side by side relationship, said display device comprising: a back wall; a base structurally associated with said back wall and upon which said vases rest; and clamping means to securely clamp each of said vases in position to said display device; each of said clamping means comprising a closed peripheral rim extending from said back wall and completely encompassing said vase; means formed adjacent said base for receiving the lip portion of said vase and a resilient member disposed opposite said lip portion receiving means and engaging said lip portion to urge the vase in a direction in which said lip portion extends into said lip portion receiving means to thereby securely clamp said vase to said display device.

3,870,155

STORAGE RACK FOR WINE BOTTLES

John D. Galloway, Box 523, Eugene, Oreg. 97401

Filed June 25, 1973, Ser. No. 373,149
Int. Cl. A47b *73/00*
U.S. Cl. 211—74 **1 Claim**



1. A storage rack for wine bottles with the rack being of modular construction permitting addition or removal of rack components to accommodate a fluctuating number of bottles, said rack comprising,

a plurality of bottle supporting members of different lengths each being of elongate shape having top and bottom edges, end walls and being of a uniform thickness,

said bottle supporting members having arcuate recesses evenly spaced along their top and bottom edges to define bottle receiving areas,

said bottle supporting members additionally having irregular surface areas evenly spaced at uniform intervals along their top and bottom edges intermediate each arcuate recess, to permit connector means disposed between stacked bottle supporting members to engage the irregular surface areas in the opposing top and bottom surfaces of two or more vertically spaced bottle supporting members regardless of the differing length of said members,

connector means joining horizontally spaced bottle supporting members and having top and bottom edges with irregular surface areas thereon for interlocking rested engagement with corresponding irregular surface areas of the bottle supporting members, said irregular surface areas of the connector means spaced apart at the same distance as consecutive irregular areas on said bottle supporting members, and

said irregular areas on said bottle supporting members and said connectors being of square configuration and of the same interval to permit bottle supporting members to rest at right angles upon subjacent bottle supporting members thereby functioning in a dual manner as connectors while also permitting bottles to be stored pointing in two or more mutually perpendicularly related directions.

3,870,156

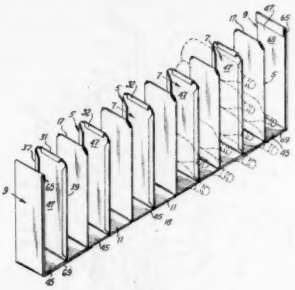
MODULAR WINE BOTTLE RACK

Edward M. O'Neill, Anchorage, Alaska, assignor to Brown Jug, Inc., Anchorage, Ala.

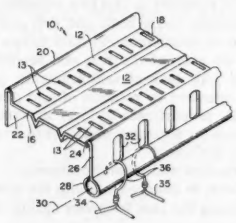
Filed Aug. 20, 1973, Ser. No. 389,666
Int. Cl. A47b *73/00;* **A47g** *29/14*
U.S. Cl. 211—74 **5 Claims**

1. A modular wine bottle rack formed of a plurality of juxtaposed, interconnected components, comprising: a plurality of first components formed of stiff sheet material, each of said first components having a bottom wall and a pair of substantially planar side walls, each of said side walls having an inner and an outer surface, a tab integral with the end portion of each of said side walls and disposed parallel with

and closely adjacent said outer surface and providing therewith an end recess of generally U-shape cross section, each of said side walls having substantially parallel edge portions, a tab integral with each of said edge portions and disposed parallel with and closely adjacent said outer surface and providing therewith a pair of side recesses of generally U-shape cross section; and a second component juxtapositioned between a pair of said first components, said second component being formed of stiff sheet material and having a base wall and a pair of substantially planar lateral walls, the side edges of said lateral walls being substantially parallel and disposed with a close sliding fit within the side recesses of the adjacent side wall of the juxtaposed first component, the end edge of each of said lateral walls being disposed within the end recess of the adjacent side wall of the juxtaposed first component.

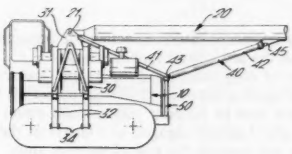


3,870,157
COMBINED LINEAL SHELF AND CLOTHES BAR SYSTEM
Donald M. Hayward, Orchard Lake, Mich., assignor to Rack-More Shelf Co., Detroit, Mich.
Filed Nov. 7, 1973, Ser. No. 413,752
Int. Cl. A47b *23/00*
U.S. Cl. 211—90 **4 Claims**



1. A combined shelf and clothes bar system adapted to be cut to the proper length at the time of installation in a closet of a house, mobile home, motor home or the like including:
   - a flat, generally elongated, substantially planar support surface having front, side, and rear edges,
   - an elongated flange extending downwardly from the rear edge of said support surface and generally perpendicular thereto, and
   - a second elongated flange extending downwardly from the front edge of said support surface and generally perpendicular thereto,
   - said second flange having a plurality of apertures therein to receive clothes hangers therethrough from in front of and from behind said second flange, and
   - said second flange terminating at its lower edge in a substantially circular bar having a curvature adapted to support a clothes hanger inserted in either direction through said apertures, the lower edges of the apertures terminating substantially at the beginning of the curvature of said bar, said circular bar having an elongated central axis lying in the same plane as said second flange to provide substantially equal support to said clothes hangers regardless of the direction of insertion of each hanger through an aperture.

3,870,158
MOBILE SPAR
Murray E. Burley, Nanaimo, British Columbia, Canada, assignor to S. Madill Ltd., Nanaimo, British Columbia, Canada
Filed May 3, 1974, Ser. No. 466,831
Claims priority, application Canada, Apr. 18, 1973, 169111
Int. Cl. B66c *23/00*
U.S. Cl. 212—8 R **6 Claims**



1. In a boom pivotally mounted on a support for swinging movement in a generally vertical plane to raise and lower the same:
   - a. a first support;
   - b. means pivotally mounting one end of said boom on said support;
   - c. power actauted articulated link means for pivoting the boom from one of a horizontal position and a vertical position to the other to raise and lower said boom, said link means comprising:
     1. a rigid link member freely pivotally connected at one end to said first support adjacent the pivotal connection of the boom; and
     2. a power actuated extendible and retractable member pivotally connected at one end to the other end of said rigid link member and at the opposite end to said boom, said latter pivotal connection being spaced from the pivotal connection of the boom to said first support;
   - d. a second support spaced horizontally from said first support upon which said first rigid link member detachably rests when in a generally horizontal position, said second support being disposed below the boom in a boom horizontal position, and
   - e. a winch mechanism mounted on said first support and including a cable, said cable being operatively associated with said winch and said boom for hauling in a load connected to the cable.

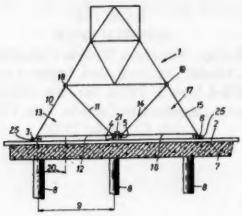
3,870,159
FRAMEWORK FOR TRAVELLING CRANE
Bonde Moeller, Zurich, Switzerland, assignor to Geschafts-und Industriebau B. Moeller & Co., Zurich, Switzerland
Filed July 27, 1972, Ser. No. 275,554
Claims priority, application Switzerland, Aug. 3, 1971, 11392/71
Int. Cl. B66c *5/02*
U.S. Cl. 212—13 **4 Claims**

1. A framework for a travelling ship crane on a rail, comprising
   - a pair of articulated support units, each constructed of struts rigidly joined in a triangular configuration to form a horizontal base and an upward extending apex,

said bases extending longitudinally and serially along the rail,

hinge means at the apex of each articulated support unit for supporting the crane,

wheel means at the base corners of each of the articulated support units for supporting the support units and crane on the rail, and



sliding joint means interconnecting the adjacent base corners of the articulated support units,

the apex of each articulated suport unit located at a horizontal spacing between the wheel means on the corners of each base to produce substantially equal loading on each wheel-means-engaged unit length of the full length of the rail beneath the pair of support units.

3,870,160

CRANE SAFE LOAD INDICATOR

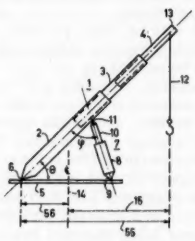
Bernard David Francis Hutchings, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed June 22, 1972, Ser. No. 265,329

Claims priority, application Great Britain, June 25, 1971, 30024/71

Int. Cl. B66c *13/16*

U.S. Cl. 212—39 R **10 Claims**



7. A safe load control system for a crane having an extensible boom pivotally mounted on a support structure and extensible boom supporting means for adjusting the boom luff angle comprising, means for producing a first signal which is proportional to the reaction of the extensible boom supporting means, means for modifying said first signal as a function of the sine of the angle formed between the boom and the extensible boom supporting means to produce a first resultant signal, means for producing a second signal which is a function of the cosine of the boom luff angle, means for mofifying said second signal as a function of the boom length to produce a second resultant signal indicative of the actual load radius, means responsive to said second resultant signal for computing a reference signal representative of the maximum safe turning moment of the boom about its pivot and corresponding to the load radius indicated by said second resultant signal, and means responsive to said first resultant signal and said reference signal for indicating the available lifting capacity of the crane at the current load condition.

3,870,161

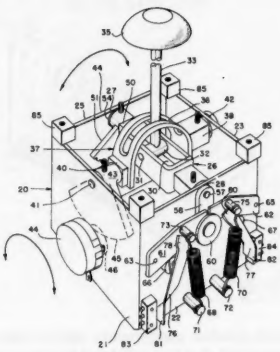
JOY STICK CONTROLLER FOR TOWER CRANE

Eldon F. Cording, Galena, Ill., assignor to Heede International, Inc., Greenwich, Conn.

Filed Feb. 28, 1973, Ser. No. 336,587

Int. Cl. B66c *23/02*

U.S. Cl. 212—56 **2 Claims**



1. In a tower crane having

a. a mast portion extending vertically;

b. a boom portion extending horizontally from and rotating about the mast portion;

c. a track on the boom having riding thereon a trolley;

d. a lift cable on the trolley and adapted to lift and lower crane loads; and

e. separate driving means for rotating the boom, moving the trolley, and lifting and lower a load;

a lever pivoted on a pair of axes disposed normal to one another, means on each of the axes for determining a signal proportional to lever movement, and means for transmitting the determined signals to the separate driving means; wherein the lever is pivoted within a first trunnion, and said lever extends within a groove in a U-shaped portion of a second trunnion pivoted normally to said first trunnion, whereby said lever can selectively rotate both said first and second trunnions separately or simultaneously; said device having a gear segment fixed on each of the first and second trunnions; a pinion engaged with each of said segments, potentiometers adapted to be operated by rotation of said pinions, whereby electrical signals proportional to lever movement are determined, and means for returning said lever to an origin, or dead center position, including

a. cams on the first and second trunnions;

b. cam followers in engagement with the cams, and

c. springs biasing the cam followers against the cams.

3,870,162

FOLDABLE CRANE

Toshihiro Nakajo, Tokyo, Japan, assignor to Unic Corporation, Tokyo, Japan

Filed Oct. 12, 1972, Ser. No. 296,852

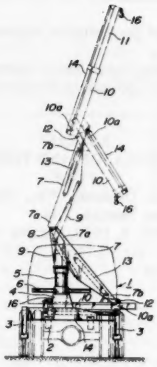
Claims priority, application Japan, Oct. 20, 1971, 46-96323

Int. Cl. B66c *23/62*

U.S. Cl. 212—59 R **1 Claim**

1. A foldable crane, comprising: a cradle having opposed side walls and a top wall connecting the upper ends of said side walls which walls define an opening extending horizontally through the length of the cradle; a swivel mechanism mounted on the top wall of said cradle; a swivel post rotatably supported by said swivel mechanism; a first boom having a U-shaped cross-section, pivotally connected at the base portion thereof to the top of the post which also has a U-shaped cross-section; a hydraulic cylinder connected between said post and

first boom for elevating said first boom; a cylindrical second boom pivotally connected at the base portion thereof to the top of said first boom; a hydraulic cylinder connected between said first and second booms for elevating said second boom; a cylindrical third boom slidably fitted into said second boom, and a hydraulic cylinder for actuating the third boom extending parallel to and along the outer side of the third boom, said



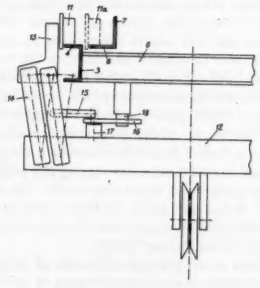
crane being foldable from a working position in which said booms extend generally upwardly in alignment with each other, to a folded position in which said second boom said third boom and its associating hydraulic cylinder are housed in the opening of said cradle after the first boom has been rotated downward after the second boom has been rotated to an acute angle relative to the first boom.

3,870,163

TELESCOPIC BOOM AND CARRIAGE WITH SHIFTABLE WHEELS THEREFOR

Pierre Joseph Pingon, 7 Ave. du Parmelan, Annecy, France

Filed Dec. 27, 1973, Ser. No. 428,912
Int. Cl. B66c *23/06, 19/00*
U.S. Cl. 212—73 **10 Claims**



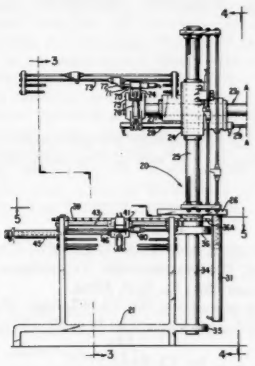
1. A telescopic boom for a tower crane or the like, comprising at least two telescopic boom sections and a carriage having wheels that roll on said sections, said sections having track surfaces disposed in a common horizontal plane, said track surfaces of one boom section being disposed in close lateral proximity to the track surfaces of another of said boom sections but laterally offset therefrom, and means for shifting said carriage wheels laterally upon passage from one said boom section to another said boom section so that said wheels pass substantially uninterruptedly along a said track surface from boom section to boom section.

3,870,164

WORK TRANSFER DEVICE

Harold A. Haase, Taunton Hill Rd., Newtown, Conn. 06470

Filed July 12, 1972, Ser. No. 271,138
Int. Cl. B66c *1/10*
U.S. Cl. 214—1 BB **8 Claims**



1. In a transfer means for moving a reaching arm to a preselected position, the combination including frame means, carriage means carrying said reaching arm, said carriage means being vertically movable relative to said frame means, arm means having said reaching arm thereon, said arm means being horizontally movably mounted on said carriage means and movable relative thereto, positioning means including shock absorbing means mounted on said arm means and movable therewith, a plurality of stop means on said carriage means, said positioning means and stop means being movable relative to each other as said arm means moves, said positioning means contacting the one of said plurality of stop means which is in the line of movement of said positioning means and shock absorbing means for stopping said arm means at a preselected position, and means for transversely moving said positioning means and shock absorbing means relative to said stop means so as to preselect the one of said stop means to be contacted by the positioning and shock absorbing means.

3,870,165

RACKING BOARD

Jan Hendrik Besijn, Bergambacht Lekdyk-Oost, Netherlands

Filed Feb. 1, 1973, Ser. No. 328,887
Int. Cl. E21b *19/00*
U.S. Cl. 214—2.5 **6 Claims**

4. Pipe racking apparatus for use on drilling rigs comprising:

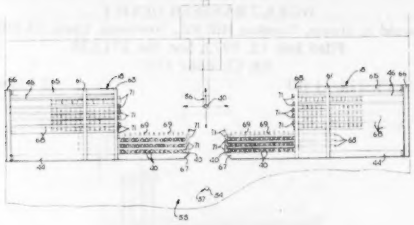
a frame;

a plurality of generally elongate coplanar racking arms, each of said racking arms being moveable along its axis with respect to said frame, said plurality of racking arms being transversely spaced in substantially parallel relationship;

said racking arms having a front and back side facing respectively the back and front sides of adjacent racking arms;

a plurality of transverse locking fingers longitudinally spaced along, and affixed to, the front side of said racking arms, said locking fingers being slideably engaged with the back side of the adjacent racking arm whereby the

adjacent front and back side of two adjacent racking arms and two adjacent locking fingers define a cell for receiving a stand of pipe; and



drive means for progressively and controllably moving and inter locking each of said racking arms with respect to said frame.

3,870,166

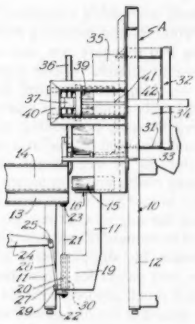
STACKING AND TRANSFERRING UNIT

Herbert G. Tull, III, Charlottesville, Va., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 73,967, Sept. 21, 1970, Pat. No. 3,701,314. This application Dec. 30, 1971, Ser. No. 213,886

Int. Cl. B65g *57/30*

U.S. Cl. 214—6 BA **2 Claims**



1. A stacking apparatus for use in combination with generally flexible rectangular objects including:

an elevator platform,

two pairs of supporting plates, the plates of each pair being in spaced parallel relation with the plates of one pair in substantially right angular relation to the plates of the other pair, said plates engaging all four edges of said objects,

means pivotally supporting each of said plates adjacent the outer edges thereof for movement from a generally horizontal position to an upwardly and inwardly inclined position,

said platform being of proper dimensions to pass between said plates in horizontal position thereof,

guide means guiding the objects against said plates upon upward movement of said platform, pivoting said plates upwardly as they pass the plates, said plates swinging downward to horizontal position after the objects pass therebetween, whereby the flexible objects will sag downwardly near the central portions thereof,

means for reciprocating said platform,

transfer means engageable with a series of objects stacked upon said supporting plates to move said objects out of alignment with said elevator platform,

said transfer means including laterally spaced bars, and including,

hook-shaped elements pivotally secured to the lower ends of said bars,

said elements, in one position, engaging beneath the trailing edges of said stacked objects during movement thereof by said transfer means, and are retracted in a second position,

means urging said hook-shaped elements toward said one position, and

means holding said hook-shaped elements in said second position prior to movement of said transfer means.

3,870,167

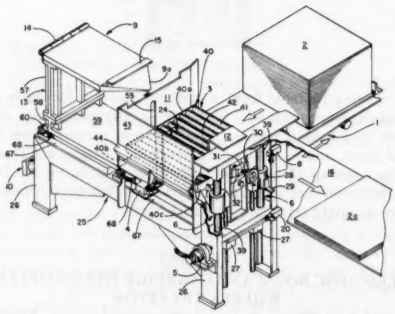
SHEET PULP SEPARATOR AND FEEDER FOR BALED PULP

Edward E. Werner, Oshkosh, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 3, 1973, Ser. No. 403,062

Int. Cl. B65g *59/02*

U.S. Cl. 214—8.5 SS **5 Claims**



1. In apparatus for separating sheets of pulp from a pulp bale, an elevator for raising a bale of pulp, lateral support means for a bale of pulp carried on the elevator, a pulp sheet separator, carrier means supporting the pulp sheet separator for movement transversely across and above the elevator in the direction of the said lateral support means and through a bale on the elevator to remove sheets from the bale, a mounting for the said carrier means, other means pivotally supporting the pulp sheet separator with respect to said carrier means so that said pulp sheet separator may be jogged in a direction transverse to the plane of the pulp sheet separator to break pulp sheets loose from a pulp bale into which the separator has penetrated, and fourth means for jogging the pulp sheet separator when the pulp sheet separator is over the elevator, said fourth means being upwardly inclined cam means on the mounting positioned to be traversed by the carrier means in said movement of the carrier means.

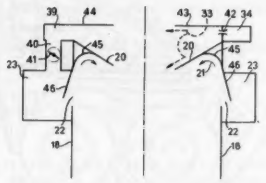
5. The method of separating a plurality of pulp sheets from a bale of pulp sheets comprising the steps of moving a bale of the pulp continuously upwardly, penetrating the bale with a relatively wide pulp separator by urging the separator substantially horizontally into the bale, and then when the separator is within the bale jogging the separator in a vertical direction to break the upper pulp sheets loose from the bale, and then removing the loosened sheets from the bale, the said method including that the lowermost sheets of the bale, following removal of the upper sheets, are raised on an edge facing the pulp separator to permit the pulp separator to pass beneath the lowermost sheets of the bale

3,870,168

ASSEMBLY FOR PREVENTING THE ESCAPE OF DUST PARTICLES DURING A MORE OR LESS FLOWING TRANSFER OF POWDERED MATERIAL

Per Tybring Aralt, Hop, Norway, assignor to Kristian Gerhard Jebsen, Bergen, Norway

Filed Mar. 2, 1973, Ser. No. 337,307
Claims priority, application Norway, Mar. 6, 1972, 692/72
Int. Cl. A01f *25/00*
U.S. Cl. 214—17 **4 Claims**



1. An assembly for preventing the escape of dust particles from a hopper having upstanding walls during transfer thereto of powdered material and the like from a powdered material supply means, said assembly comprising

baffles located interiorily of said hopper adjacent the top thereof and defining an access opening in said hopper to permit entry thereto of said powdered material supply means, said baffles extending downwardly and inwardly of said hopper to deflect any movement of dust particles away from said access opening,

first and second opposedly directed housing components disposed at the top of said hopper at a location above said baffles,

a source of compressed air,

conduit means for comunicating compressed air from said source to the first of said housing components, said first housing component including means for directing a curtain flow of compressed air therefrom across said hopper access opening in the direction of said second housing component, said second housing component being open to permit entry of compressed air thereto,

a duct encircling an upper portion of said hopper,

means for maintaining a condition of vacuum in said duct, and

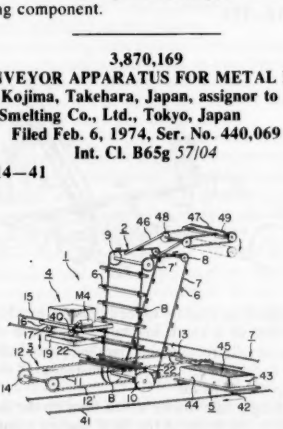
means for establishing communication between said duct and both the interior of said hopper and said second housing component.

3,870,169

CONVEYOR APPARATUS FOR METAL BARS

Hiromitsu Kojima, Takehara, Japan, assignor to Mitsui Mining and Smelting Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 440,069
Int. Cl. B65g *57/04*
U.S. Cl. 214—41 **2 Claims**



1. A conveyor apparatus for metallic bar-formed objects comprising:

1. a first coveyor having a vertically disposed, and intermittenly driven member, adapted to receive laterally disposed metallic bar-formed objects at its upper portion during its stationary phase, and to convey the received objects sequentially downward;

2. a second conveyor having an intermittently driven member that is horizontally disposed underneath said first conveyor in an intersecting relationship therewith, adapted to receive on its upper side those metallic bar-formed objects, which are delivered by said first conveyor, during its stationary phase, and to convey them sequentially in a horizontal direction;

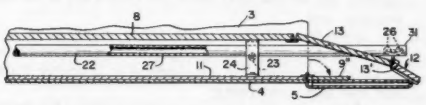
3. a hanging truck having a vertically movable electromagnet in its lower part, adapted to be driven along a line intersecting the travelling direction of said second conveyor, at a predetermined distance therefrom, whereby said electromagnet is normally positioned above said second conveyor at a predetermined distance upward therefrom, but when a required number of metallic bar-formed objects are aligned on the second conveyor, said electromagnet is lowered, siezes the aligned objects through electromagnetic attraction, and is lifted, thereupon the truck is driven horizontally to its stroke end position where the electromagnet is deenergized.

3,870,170

LOADING RAMP FOR PICK-UP TRUCKS AND THE LIKE

Donald E. Noble, Rt. No. 4, and Robert H. Sanderson, Star Rt., both of Canton, N.Y. 13617

Filed June 6, 1973, Ser. No. 367,318
Int. Cl. B60p *1/00*
U.S. Cl. 214—85 **3 Claims**



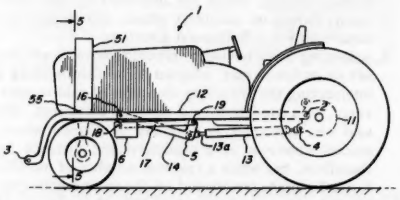
1. The combination with a load-receiving platform, of means defining a storage compartment beneath said platform, said compartment defining an entrance at one end of the same, a gangplank normally stored within said compartment when not in use but being withdrawable from said compartment to provide a ramp extended from the adjacent edge of the platform, said ramp having roller means mounted thereon at one end thereof, and guide track means mounted in the storage compartment and extended longitudinally thereof for receiving and guiding the roller means aforesaid during withdrawal and retraction of the gangplank out of and into the storage compartment, said track means being movably supported above the bottom of the storage compartment for permitting partial extension of the track means beyond the entrance of the compartment, and the gangplank being suspended from and below the track means by the gangplank rollers coacting therewith.

2. The combination as defined in claim 1, wherein the gangplank is provided with a foldable flap which is hingedly connected to one end thereof, said flap normally overlying the ramp in a reversely folded position when the ramp is retracted into the storage compartment but being pivotally movable to an unfolded position to form an extended continuation of the gangplank when the gangplank is withdrawn from the storage compartment.

3,870,171
LIFTING MECHANISM FOR FRONT END LOADER

Emil F. Zimmerman, Richardton, N. Dak. 58652

Filed May 18, 1973, Ser. No. 361,518
Int. Cl. B66f 9/00
U.S. Cl. 214—131 R 13 Claims



1. An apparatus for connecting to lifting tools and attachable to a tractor frame, comprising:

a pair of elongated booms each pivotally mounted on a side of the tractor at a point near the tractor rear axle, and extending forwardly to the tractor front end for connection to a lifting tool and movable between a substantially horizontal rest position and an elevated position, the apparatus having on each side of the tractor:

a. a first link pivotally mounted at one end to the boom, and a second link pivotally mounted at one end to the tractor frame forward of the tractor's center of gravity and at its other end to the other end of the first link, the links being crossed when the booms are in the rest position

b. a hydraulic jack pivotally mounted to the tractor frame at a point near the tractor rear axle and having an extendible rod pivotally connected to the other end of the first link at a point lower than the pivotal connection between the first and second links when the booms are in the rest position; and

c. an upwardly extending guide frame mounted to said tractor in slideable, guiding engagement with said boom.

8. Lifting apparatus for attachement to a tractor frame and rear axle, comprising:

a pair of rear axle housings, each having means for rigidly attaching to the tractor rear axle at a point interior to a rear wheel, and having at least two pivotal mounting connections;

a pair of booms, each mounted at one of its ends to said housing pivotal mounting connections and extending therefrom to a position forward the tractor frame, and having a forward end adaptable for connection to a tool;

a pair of first frame brackets, each rigidly attached to the tractor frame in alignment with a boom at a point forward the center of gravity of said tractor, and having a pivotal mounting connection;

a pair of upwardly extending boom guide frames rigidly attached to respective sides of said tractor and slidably engaging the respective booms to stabilize lateral motion of the latter

a pair of L-shaped first links each pivotally connected at one end to a respective boom at a point substantially adjacent said first frame bracket pivotal mounting connection and having a rearwardly extending link end

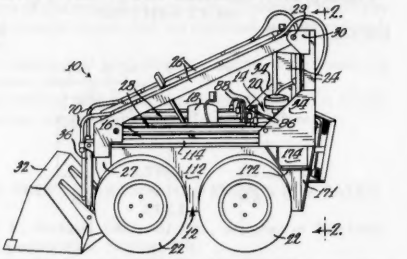
a pair of second links each pivotally connected at one end to a respective first frame bracket pivot mounting point and extending rearwardly in crossing relation to the first link for pivotal connection to the rearwardly extending link end of the first link; and

pair of hydraulically actuated cylinders, each of said cylinders pivotally mounted to said rear axle housing pivotal mounting connections, and having an extendible rod pivotally connected to the vertex of one of the L-links at a distance below the pivotal connection between the first and second links.

3,870,172
FRAME STRUCTURE FOR LOADER

Mortimer J. Huber, 5901 W. Bald Eagle Blvd., St. Paul, Minn. 55110

Filed May 15, 1972, Ser. No. 252,997
Int. Cl. B66f 9/00
U.S. Cl. 214—140 13 Claims



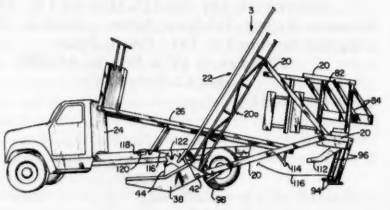
1. A tractor vehicle for use in handling material comprising:

a vehicle body having an engine space at the rear end thereof and a forward space for the operator's leg with a seat for the operator mounted on said body intermediate said engine space and forward space, said body including a rigid plate bent at spaced locations to define a bottom wall and side walls for said spaces with an outwardly directed flange at the upper end of each of said side walls; an engine mounted in said engine space; ground engaging members rotatably supported on each of said side walls; drive means connecting said engine to said ground engaging members; a stanchion projecting upwardly from each of said flanges adjacent the engine space; a lifting arm pivotally connected to each stanchion with each arm extending forwardly along the associated flange and downwardly adjacent the front end of said body; a material handling member mounted on the forward end of said arms; and means cooperating with said arms to raise said arms and the material handling member mounted thereon.

3,870,173
BALE LOADER

Richard B. Miskin, Ucon, Idaho, assignor to Miskin Scraper Works, Inc., Ucon, Idaho

Division of Ser. No. 233,430, March 9, 1972, Pat. No. 3,809,256. This application Mar. 1, 1974, Ser. No. 447,067
Int. Cl. B65g 57/32
U.S. Cl. 214—152 1 Claim



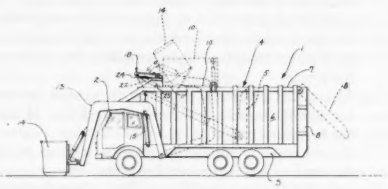
1. A method for loading spaced bales of hay lying on a field onto the bed of a truck in abutting stacked configuration within a generally rectangular parallelepiped reference space above the bed as the truck continuously moves along the field, comprising the steps of:

a. attaching a bale loader which rests on the field when not in use to the truck at the field loading locus;

b. sequentially picking up the bales with the loader and conveying same to an assembly station above the rear end of the bed while in a forwardly and upwardly inclined

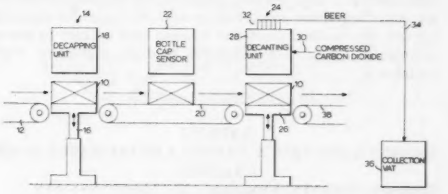
position and depositing same thereat in layers normal to the bed until a bale wall of desired height is formed;
c. pushing the wall toward the front end of the bed a distance at least the thickness of the wall to thereby provide a space behind same in which a next wall may be formed;
d. continuing the formation and pushing of the walls until a desired bed load is formed on the bed;
e. clamping the rearmost wall against the bed to prevent it from falling or sliding rearwardly;
f. lowering the bed to horizontal position after it has been filled with a bale load;
g. transporting same to an unloading locus while in horizontal position, and
h. elevating the bed toward a vertical position at the unloading locus for unloading.

3,870,174
OVERFLOW SHIELD FOR REFUSE COLLECTION VEHICLE BODY HOPPER OPENING
John R. Brisson, Kingsford, Mich., assignor to Lodal Inc., Kingsford, Mich.
Filed Sept. 13, 1973, Ser. No. 396,847
Int. Cl. B65f *3/02*
U.S. Cl. 214—303 **2 Claims**



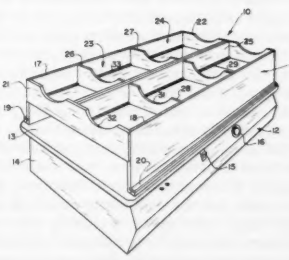
1. A refuse collection vehicle comprising, in combination:
a. a frame mounted on the vehicle,
b. a refuse receiving body disposed on said frame, said body having a top roof section with an opening therein,
c. closure means for closing said opening,
d. control means for actuating said closure means to selectively open or close said opening,
e. a pivotable boom on the forward portion of said vehicle and adapted to receive a refuse container thereon,
f. means to pivot said boom from a lowered position upwardly to a raised position so that refuse is dumped from said container through said opening and into said body when said closure means is open,
g. a transversely extending shield member independent of said closure means and with said shield member having a rearward edge disposed proximate the forward edge of said opening, said shield member receiving spillage of refuse forwardly of said forward edge of said opening during dumping,
h. means hinging said rearward shield edge to said frame,
i. and means independent of said control means to hingedly tilt said shield from a normal generally horizontal position forwardly of said opening to a generally vertical position subsequent to refuse dumping for returning spillage into said opening before said closure means closes said opening.

3,870,175
DECAPPING OF BOTTLES AND DECANTING THE LIQUID CONTENTS THEREOF
Daniel Dilanni, Toronto, Ontario, Canada, assignor to Carling O'Keefe Limited, Toronto, Ontario, Canada
Filed May 6, 1974, Ser. No. 467,013
Int. Cl. B65d *81/32*
U.S. Cl. 214—304 **14 Claims**



1. A bottle decapping and decanting apparatus comprising:
conveying means to convey a case containing a plurality of capped beer-containing bottles to a decapping station,
decapping means at said decapping station for removing simultaneously the caps from all said bottles in said case, conveying means for conveying said case containing decapped bottles from said decapping station to a decanting station,
sensing means situated between said decapping and decanting stations for sensing the absence of caps on the bottles in said case,
decanting means at said decanting station for displacing simultaneously the beer from all said decapped bottles and including tube means insertable into each of said bottles and conduit means capable of connecting a source of compressed gas substantially inert to beer with beer in each of said bottles for displacement of beer from said bottles through said tube means,
conveying means for conveying said case containing decanted bottles away from said decanting station, and
conduit means extending from said decanting means to a collection means for conveying decanted beer from said decanting station to said collection means, whereby the said bottles to be decapped and decanted are conveyed such that the bottles always remain upright during the conveying, decapping and decanting operations.

3,870,176
APPARATUS FOR REMOVING ARTICLES FROM ENVELOPES
David W. Gernetzke, 420 Montgomery, Novato, Calif. 94104
Filed Aug. 24, 197[illegible]er. No. 283,547
Int. Cl. B65b *21/02*
U.S. Cl. 214—308 **11 Claims**



1. Apparatus for removing articles contained within an envelope having oppositely facing, closely spaced-apart, flat

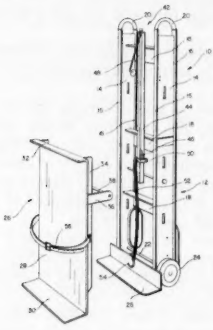
side walls joined together along common peripheral edge portions thereof, said envelope being open along at least an additional common peripheral edge portion of said side walls, comprising the combination of an envelope carrier, said carrier having means forming at least one compartment, means associated with the compartment to support a group of said envelopes along at least a portion of their additional common edge portions in substantially vertically extending planes and with said open edge portions disposed lowermost, and means for imparting vibratory motion to said envelopes for separating the side walls thereof and causing said articles to move downwardly from said envelopes through said open edge portions.

3,870,177

MOBILE HAND TRUCK HAVING A DETACHABLE LOAD CRADDLE

Willard J. Cobb, Rt. 5, Raleigh, N.C. 27607

Filed June 25, 1973, Ser. No. 373,154
Int. Cl. B62b *1/04*
U.S. Cl. 214—372 **8 Claims**



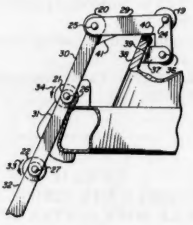
1. A mobile hand truck comprising: a frame structure including a pair of laterally spaced side frame members; a wheel means mounted to said frame structure; a detachable load cradle movably mounted on said frame structure and including a back slidably mounted on one side of said frame structure, said load cradle including a pair of laterally spaced arms fixed about the outside edges thereof and extending rearwardly therefrom, said arms being particularly spaced greater than the width of said side frame members as to extend adjacent the outer sides thereof and having a length greater than the width of said side frame members such that the rear terminal ends of said arms normally project past the rear edge of said side frame members; detachable securing means associated with said load cradle for detachable securing the latter to said frame structure, said detachable securing means including a transverse rod detachably secured to the rear terminal ends of said arms and normally engaged with the rear side of said side frame members so as to hold and confine said load cradle against the front side of said frame structure, whereby said load cradle may be completely detached and separated from said frame structure by detaching said transverse rod from said arms; elevating means disposed on said frame structure; and means for operatively interconnecting said elevating means with said load cradle whereby said load cradle may be raised and lowered relative to said frame structure by actuating said elevating means.

3,870,178

AUTOMOBILE TRUNK MOUNTED CONVEYOR FOR HANDLING HEAVY OBJECTS

Harry J. Ellen, 499 W. Missouri Ave., Phoenix, Ariz. 85013

Division of Ser. No. 346,718, April 2, 1973,. This application Mar. 8, 1974, Ser. No. 449,233
Int. Cl. B60r *9/00*
U.S. Cl. 214—450 **3 Claims**



1. A collapsible ramp for mounting in the trunk of an automobile for aiding in loading and unloading luggage therefrom comprising;

a pair of brackets for spacedly mounting in the trunk adjacent the edge of the trunk opening at the rear of the automobile,

a pair of identical L-shaped brackets having common legs thereof each pivotally mounted to a different one of said brackets so that the other of said legs of said L-shaped brackets may be pivotally moved to lie horizontally within the trunk and when rotated about said brackets assumes another horizontal position with their free ends outside of the trunk,

a first roller pivotally mounted to extend between said L-shaped brackets at the interconnection of the legs of the brackets, and

a second roller pivotally mounted to extend between the free end of said L-shaped brackets,

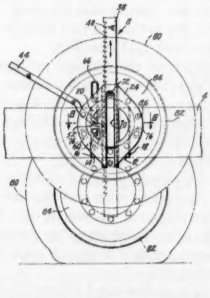
said first and second rollers aiding in supporting luggage being placed in or removed from the trunk.

3,870,179

SPARE WHEEL CARRIER FOR LOGGING TRUCKS

Willard E. Colpitts, Box 324, Dayville, Oreg. 97825

Filed June 1, 1973, Ser. No. 366,994
Int. Cl. B62d *43/00*
U.S. Cl. 214—454 **6 Claims**



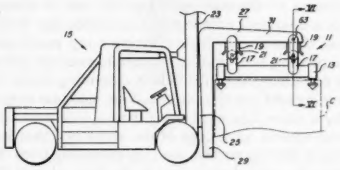
1. A spare wheel carrier for mounting on a vehicle frame, comprising: a bracket; a ratchet bar having teeth along one edge thereof; means on said bracket mounting said ratchet bar for vertical sliding movement; a jack handle; means pivotally mounting said jack handle on said bracket, whereby said jack handle is engageable with said teeth on said ratchet bar to

effect vertical movement thereof; a dog pivotally carried by said bracket, and engageable with said teeth on said ratched bar to prevent downward sliding movement of said ratchet bar; a stud bolt mounted on the central portion of the front face of said ratchet bar for securing a wheel thereto, said bracket having an inverted U-shaped slot for verticálly slidingly receiving said stud bolt; and means operable for securing a wheel carried by said stud bolt on said ratchet bar to said bracket when said wheel has been elevated into a carriage position relative to said bracket.

3,870,180
APPARATUS FOR CONNECTING A SPREADER ASSEMBLY TO A VEHICLE LIFT

Murdock M. Snelling, Jr., Louisville, Miss., assignor to Taylor Machine Works, Louisville, Miss.

Filed May 21, 1973, Ser. No. 362,046
Int. Cl. B66f *9/12*
U.S. Cl. 214—621 **9 Claims**



1. An apparatus for removably connecting a spreader assembly to a lift vehicle including a normally vertical boom, a load carriage movably mounted on the boom, and a frame member mounted on the carriage having normally horizontal arm portions, said apparatus comprising:

a. pilot means mounted on the upper surface of the spreader assembly, said pilot means including a plurality of male members, each of said male members having an enlarged transverse hole therethrough;

b. connecting means mounted on the lower surface of the arm portions for self-aligning engagement with said pilot means to removably connect the spreader assembly to the lift vehicle, said connecting means including a plurality of female members for coacting with the plurality of said male members, each of said female members having a transverse hole therethrough; and

c. securing means for securely connecting said pilot means to said connecting means, said securing means including primary pins for passing through said holes in said male and female members thereby securing said male members to said female members when said male members are positioned in said female members while allowing limited movement of said male members.

3,870,181
MOLECULARLY ORIENTED BOTTLE

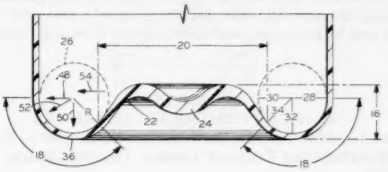
Thomas F. Sincock, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 12, 1973, Ser. No. 331,475
Int. Cl. B65d *23/00*
U.S. Cl. 215—1 C **11 Claims**

1. A bottle for a beverage under pressure formed of a polymer wherein the major constituent is polymerized acrylonitrile monomer, said bottle comprising:

a. a generally cylindrical body which includes a sidewall portion having a discharge opening at its upper end and means formed therein adjacent said opening for cooperating with a pressure-confining closure;

b. a bottom portion at the other end of the sidewall portion comprising a substantially toroidal segment between the sidewall and an inner base wall surrounded by and integral with said toroidal segment and closing off the bottom portion of the bottle, the radius of curvature of said toroidal segment being between 10 to 20 percent of the maximum diameter of the generally cylindrical body, the surface area of said toroidal segment being at least 30 percent of that of a full torus, said toroidal segment having a varying overall wall thickness within a range of between 12 to 60 mils, said thickness gradually increasing



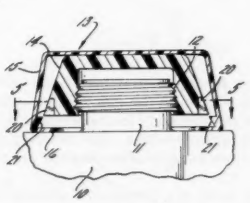
within such range along said toroidal segment toward said inner base wall; and

c. the polymer in at least a portion of said segment being molecularly oriented exhibiting an orientation release stress of at least 50 psi in both the axial and circumferential directions.

3,870,182
SAFETY CAP FOR THREADED CLOSURE

Walter L. Georgi, Cary, Ill., assignor to Palspros, Inc., Woodstock, Ill.

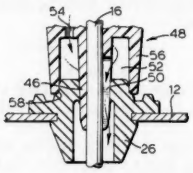
Filed Apr. 23, 1973, Ser. No. 353,471
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—220 **4 Claims**



1. A safety closure for containers having external threaded openings, said closure comprising the combination of an internally threaded inner closure member adaptepd to be threaded onto the externally threaded opening of the container to close said opening, said inner closure member and said container being shaped to form an open space directly beneath at least the outer peripheral portion of the bottom of said inner closure member when said member is threaded onto said container, said inner closure member also forming a plurality of recesses in the outer side wall thereof, an outer closure member fitted over said inner member and freely rotatable relative to said inner member to normally prevent rotation of said inner member, the top of said outer member overlapping the top of said inner member and the bottom of said outer member forming a flange extending radially inwardly beyond the outer periphery of the bottom of said inner member in said open space to hold said outer member captive on said inner member, the axial dimension of the internal space between the top of said outer member and said flange being substantially greater than the maximum axial dimension of said inner member to permit limited axial movement of said outer member relative to said inner member, said outer closure member forming a plurality of lugs projecting inwardly from the inner sidewall thereof, said lugs being axially spaced away from the recesses in the outer sidewall of said inner member when said outer member is in its lowermost position where said flange is spaced away from the bottom of said inner member, said lugs also being normally radially spaced away from said recesses at

any axial position of said outer member relative to said inner member, said lugs being located for axial alinement with said recesses when said outer member is in its uppermost position where said flange engages the bottom of said member, the sidewalls of said outer closure member being sufficiently flexible to permit said lugs to be pressed into said recesses when alined therewith to provide latching engagement between said inner and outer members whereby said inner member may be rotated to remove the closure from said container.

3,870,183
CLOSURE FOR LIQUID CONTAINERS
John Luczkiw, Toronto, Ontario, Canada, assignor to Viceroy Manufacturing Company Limited, Toronto, Ontario, Canada
Filed Apr. 9, 1973, Ser. No. 349,645
Int. Cl. B65d *47/36*
U.S. Cl. 215—247 **5 Claims**



1. A closure for liquid containers from which the liquid therein is to be withdrawn through a hollow tube inserted into said container through said closure, when said liquid is acted against by gas pressure within said container and communicated thereto from a source of pressurized gas external to said container;

said closure being of a deformable material which may be pierced by said tube and which, when pierced with said tube extending therefrom, forms a substantially gas and liquid-tight seal around said tube;

said closure being adapted to be fitted into an opening in said container, and having a peripheral neck portion formed therein and dimensioned so as to form a substantially gas and liquid-tight seal between the closure and the edges of said opening;

said closure having

an upwardly extending channel formed in the underside thereof for communication with the interior of said container, said channel having an annular wall;

a gasket portion overlying said upwardly extending channel and having a diaphragm portion formed therein, said diaphragm portion being of lesser thickness than said gasket portion and with its upper surface recessed below the upper surface of said gasket portion;

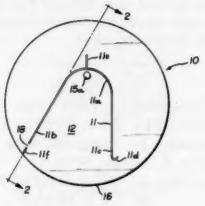
a flange portion surrounding said gasket portion and below the upper surface thereof;

an annular upwardly extending rim formed on the upper surface of said flange portion,

the height of said annular rim being such that the top thereof tends to interfere with the edges of said gasket portion when said flange portion is turned upwardly at any place;

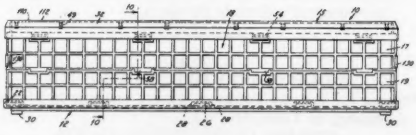
the diameter of said diaphragm portion being such as to accommodate the neck portion of a tapping device in which said tube is secured, the diameter of said upwardly extending channel being greater than the diameter of said neck portion of said tapping device.

3,870,184
EASY OPEN METAL CLOSURE
Thomas D. Fuchs, Toledo, and John J. Micka, Maumee, both of Ohio, assignors to Owens-Illinois Inc., Toledo, Ohio
Filed July 9, 1973, Ser. No. 377,641
Int. Cl. B65d *41/32*
U.S. Cl. 215—255 **5 Claims**



1. A closure of the tear-open type for use in closing an opening of a container comprising a severable tear strip integral in said closure, said closure having a top panel portion, annular depending skirt portion adapted to encircle said opening of the container, and an annularly extending corner radius portion joining said top and skirt portions, said tear strip being defined by a score line weakening means, said tear strip including two spaced apart legs of the score line that join together only in the top portion, one leg extending from the top portion into the skirt portion and to the free edge at the periphery thereof and is interrupted and discontinuous near said free edge of said skirt, the free edge of the skirt being rolled and said interrupted portion of the one score leg being disposed in said rolled edge portion of the skirt, a pull member for severing the tear strip, and means connecting the pull member to said tear strip near the junction of said two score line legs in the top portion for effecting the severing of the integral tear strip of said closure for removal of the latter from a container.

3,870,185
COLLAPSIBLE CONTAINER
Ellsworth E. Sanders, Sanibel Island, Fla., and Elsmer W. Kreeger, Pontiac, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.
Continuation-in-part of Ser. No. 259,844, June 5, 1972, Pat. No. 3,796,342. This application Oct. 29, 1973, Ser. No. 410,374
Int. Cl. B65d *7/24*
U.S. Cl. 220—6 **8 Claims**



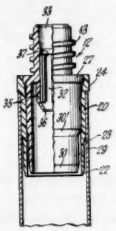
1. A plastic collapsible container comprising a rectangular bottom wall, two opposed vertical side walls, two opposed vertical end walls, a top rectangular border frame defining the top of the container, said side walls each having upper and lower wall sections, said border frame, upper and lower side wall sections, said end walls and said bottom wall being separately formed, means providing snap hinge connections between the adjacent edges of said upper and lower wall sections, means providing snap hinge connections between the upper edges of said upper wall sections and said border frame and means providing snap hinge connections between the lower edges of said lower wall sections and said bottom wall to permit inward folding of said side walls when said container

is collapsed, and means providing snap hinge connections between the upper edges of said end walls and said border frame to permit inward swinging of said end walls to a substantially horizontal position when said container is collapsed.

3,870,186
CONTAINER CONSTRUCTION FOR MASCARA AND LIKE SUBSTANCES

Willy Reinhard, Buergeln, Germany, assignor to Gebruder Seidel KG, Marburg, Germany

Filed Feb. 20, 1973, Ser. No. 333,780
Int. Cl. A46b *11/00;* **A45d** *44/18;* **F16l** *21/04*
U.S. Cl. 220—212 **16 Claims**



1. In a container for liquid cosmetic or the like substance, a body having a tubular open end, a flanged cylindrical tubular bushing of relatively yieldable material received in said open end to an extent axially limited by the flanged portion of said bushing, and a flanged relatively stiff dispensing fitting including an upwardly extending threaded neck with an internal passage open at both axial ends, said fitting having a tubular sleeve received in said bushing to an extent axially limited by the flanged portion of said fitting, said bushing having an unstressed external cylindrical diameter less than the bore diameter of the tubular open end in which it is received, whereby bushing sub-assembly to said body is essentially frictionless, and said sleeve having an external cylindrical diameter greater than the unstressed bore diameter of said bushing and being chamfered at the lower end, whereby assembly of said fitting to the sub-assembled bushing and body is a force-fit in which said bushing is radially expanded, the extent of sleeve-to-bushing interference being such in relation to the unstressed clearance of the subassembled parts that said bushing is radially compressionally loaded in circumferentially continuous engagement with the body bore upon assembly of said fitting.

3,870,187
CHILDPROOF AEROSOL CAP

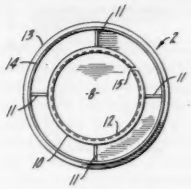
Richard H. Bennett, Kenilworth, Ill., assignor to Knight Engineering and Molding Co., Arlington Heights, Ill.

Continuation of Ser. No. 81,260, Oct. 16, 1970, abandoned. This application Oct. 11, 1972, Ser. No. 296,515
Int. Cl. B67d *5/00;* **B65d** *43/10*
U.S. Cl. 220—281 **4 Claims**

1. A removable and replaceable cover for a container such as an aerosol container having a domed roof, a circular collar having an undersurface located above said domed roof and surrounding a dispensing actuator, said cover including:

a top wall, a relatively thin flexible outer sleeve depending from said top wall, a relatively thin flexible inner sleeve generally coaxial with said outer sleeve and also depending from said top wall, an inwardly projecting distortable locking flange carried by said inner sleeve and adapted to engage the undersurface of said circular collar of said container when said cover is installed on said container, at least one slit formed in said inner sleeve and extending through said locking flange to allow distortion of said locking flange, and

a plurality of ribs connecting said inner and outer sleeves to transmit forces applied to said outer sleeve between said

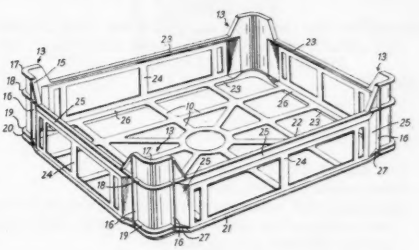


sleeves, said ribs being spaced around the periphery of said inner sleeve so as to cause distortion of said locking flange upon the transmission of forces between said sleeves.

3,870,188
TRAY OR CRATE

Thomas Vigus Buffett, London, England, assignor to International Partners Research Corporation, Panama City, Panama

Filed Dec. 22, 1972, Ser. No. 317,690
Claims priority, application Great Britain, Jan. 13, 1972, 1752/72
Int. Cl. B65d *1/42, 1/22*
U.S. Cl. 220—72 **4 Claims**



1. A tray of moulded construction having two pairs of opposite upstanding side walls and curved corner portions extending between adjacent side walls, each of said side walls having outwardly projecting stiffening flanges extending along its top and bottom edges and vertical stiffening flanges where the side wall joins the corner portions, the whole of each side wall except those parts of the side wall adjoining said flanges being offset outwardly substantially into a plane containing the outer edges of said stiffening flanges.

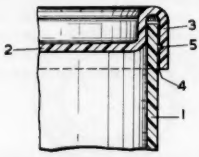
3,870,189
CONTAINER WITH A FRANGIBLE LID AND A TOOL FOR OPENING SAID CONTAINER

Reinder Zuideveld, Ewshott, England, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Jan. 12, 1973, Ser. No. 322,925
Int. Cl. B65d *17/00*
U.S. Cl. 220—277 **6 Claims**

1. A container with a lid, both made of thermoplastic synthetic material, said lid having an inverted channel-shaped edge portion fitting over the upper edge of the container and attached to the outer surface of the container wall with the inner surface of the outer leg of said channel-shaped edge, said outer leg between the upper edge of the container wall and the attachment of the outer leg of the lid to said container

wall being provided with a peripheral wall portion of reduced thickness, and a circumferentially extending clearance located radially inwardly of said leg portion of reduced thickness and



between said leg portion and the container wall, said portion of reduced thickness at least at one place being provided with an opening connecting the clearance with the outside of the container and lid.

3,870,190

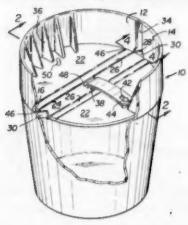
CONTAINER

Edward Camp Tibbals, Jr., 2680 Young Field St., Boulder, Colo. 80215

Filed Feb. 12, 1973, Ser. No. 331,507

Int. Cl. B65d *43/16*

U.S. Cl. 220—338 **10 Claims**



1. A container comprising

vessel means including an opening,

supporting shelf means perimetrically disposed on the interior surface of said vessel means in predetermined spaced relation with the opening therein,

lid means perimetrically supported by said shelf means and peripherally engageable with the interior surface of said vessel means adjacent to said shelf means for closing said container,

said lid means including a rotatably displaceable central portion and a pair of substantially lineally displaceable end portions,

and manually manipulable means for rotatably displacing said central portion of said lid means in one direction to selectively advance the perimetric edges of said end portions into peripheral compressive engagement with the interior surface of said vessel means to close said container and in a second direction to selectively retract said end portions to displace said perimetric edges thereof into spaced relation with the interior surface of said vessel to open said container.

3,870,191

HOT GREASE GUARD FOR COOKING UTENSIL

Harold J. Franklin, 1410C - 24th St., North, Birmingham, Ala. 35234

Filed May 20, 1974, Ser. No. 471,362

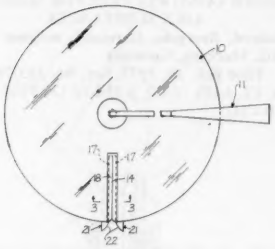
Int. Cl. B65d *51/16*

U.S. Cl. 220—370 **6 Claims**

1. A hot grease guard for a cooking utensil comprising

a. a disc-like member of a size to cover a cooking utensil,

b. a handle pivotally connected to a central portion of said disc-like member with said disc-like member being adapted for pivotal movement to selected angular positions relative to said handle, and



c. a laterally and outwardly opening slot in said disc-like member disposed to receive a fork-like member so that said disc-like member is rotatable to position said fork-like member at selected angular positions and said fork-like member is movable to selected positions inwardly of said disc-like member.

3,870,192

SELF-LOCKING DISPENSER

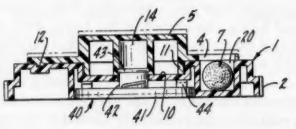
Chester J. Haley, Waukegan, Ill., assignor to Northwest Molded Products Corp., Waukegan, Ill.

Continuation of Ser. No. 206,841, Dec. 10, 1971, abandoned.

This application June 29, 1973, Ser. No. 375,098

Int. Cl. G07f *11/00*

U.S. Cl. 221—86 **5 Claims**



1. A dispensing container comprising,

a base member having a plurality of pockets positioned thereon to contain objects to be dispensed,

an outlet member rotatably connected to said base member and having an outlet opening sequentially positionable over said pockets to permit escape of said objects from said container,

cooperating locking configurations carried by said outlet and base members,

said locking configurations, when engaged, preventing relative rotational movement of said outlet and base members,

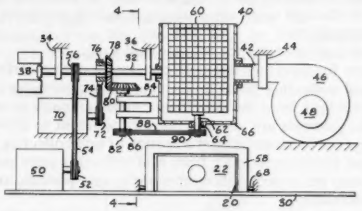
means biasing said locking configurations into engagement one with the other,

nd a connection between said biasing means and said outlet member which allows rotation of the outlet member relative to said biasing means and by which a digital force applied directly to the baising means in the direction of the outlet member lifts the outlet member to disengage said locking configurations permitting relative rotation of said outlet and base members.

3,870,193
APPARATUS FOR HEATING AND DISPENSING FRENCH FRIED POTATOES

J. Raymond Schneider, 97 N. Chadsworth Ave., Larchmont, N.Y. 10538

Filed Mar. 1, 1973, Ser. No. 337,144
Int. Cl. A47j 43/00
U.S. Cl. 221—150 A 6 Claims



1. Apparatus for heating and delivering freshly heated French Fried potatoes, comprising

rotatable open ended cage means sequentially displaceable from a first charge receiving position to a second charge tumbling position and to a third charge delivering position,

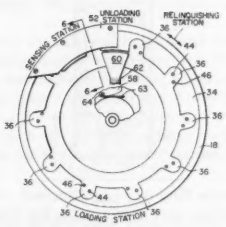
means for independently rotating said cage means in said second and third positions thereof, means for directing a stream of heated air into heat transfer relation with the tumbling charge in said cage means when the latter is rotatably disposed in its second position,

and cyclically operable control means for effecting the sequenced displacement of said cage means in predetermined timed relation from said first to said second to said third position.

3,870,194
APPARATUS FOR ORIENTING AND FEEDING ARTICLES

Clarence Taylor, 28 Woodside Dr., Rochester, N.Y. 14526

Filed Jan. 28, 1974, Ser. No. 437,156
Int. Cl. B23q 7/02; B65h 9/00
U.S. Cl. 221—160 18 Claims



1. In an article feeding mechanism for feeding articles of the type having a substantially planar surface on one side and a non-planar surface on the opposite side, the combination comprising:

a movable work table having at least one article receiving pocket which is movable successively through loading, sensing and unloading stations, said pocket having an article supporting surface;

means for loading an article in said pocket in random orientation at said loading station, said article being properly oriented in said pocket when said substantially planar surface is in engagement with said supporting surface, and improperly oriented when said non-planar surface is in engagement with said supporting surface;

sensing means associated with said pocket and movable between a retracted position in which a part of said sensing means does not extend through said supporting surface into said pocket, and an extended position in which said part extends through said supporting surface into said pocket to prevent an article in said pocket from escaping;

means at said sensing station on one side of said supporting surface for retaining an article in said pocket;

means at said sensing station on the opposite side of said supporting surface for biasing said sensing means to its extended position when an article is missing from said pocket or improperly oriented in said pocket;

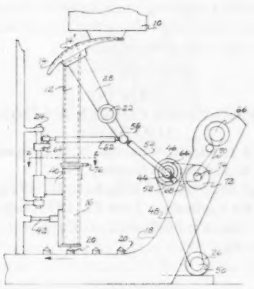
said part of said sensing means adapted to engage said substantially planar surface of a properly oriented article at said sensing station to prevent movement of said sensing means to its extended position by said biasing means; and

holding means at said unloading station adapted when said sensing means is in its retracted position at said sensing station to releasably hold said sensing means in its retracted position while said pocket is moved through said unloading station whereby a properly oriented article is free to be fed from said pocket, and adapted when said sensing means is moved to its extended position at said sensing station to releasably hold said sensing means in its extended position while said pocket is moved through said unloading station whereby an improperly oriented article in said pocket is retained therein for passage through said unloading station.

3,870,195
APPARATUS FOR AND METHOD OF FEEDING BOBBIN TUBES

Lester W. Pray, and Gordon C. Anderson, both of Clemson, S.C., assignors to Saco-Lowell Corporation, Easley, S.C.

Filed Apr. 26, 1973, Ser. No. 354,847
U.S. Cl. 221—225 13 Claims



1. In a bobbin orienting and feeding apparatus having bobbin orienting means for successively receiving unoriented bobbins through an inlet thereof and for discharging oriented bobbins through an outlet thereof, and bobbin transporting means movable between a bobbin receiving position adjacent said orienting means and a bobbin discharging position adjacent a bobbin-loading station distal from said orienting means for transporting oriented bobbins one at a time from said orienting means to said loading station, the improvement comprising:

bobbin retaining means responsive to movement of said transporting means for permitting discharge of oriented bobbins from said outlet of said orienting means when said transporting means is in said bobbin-receiving position thereof and for at other times restraining discharge of bobbins from said orienting means; said bobbin retaining means comprising a platform-like member mounted upon said transporting means in adjacent relationship to

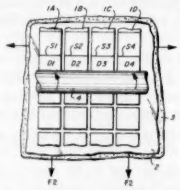
said outlet for movement in unison with said transporting means between a closed position wherein said member prevents discharge of bobbins through said outlet and an open position wherein said member permits discharge of bobbins through said outlet.

3,870,196

HIGH YIELD METHOD OF BREAKING WAFER INTO DICE

Don Hargraves, Pepperell, Mass., assignor to Laurier Associates, Inc., Littleton, Mass.

Filed Sept. 28, 1973, Ser. No. 401,940
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **2 Claims**



1. The method of breaking a wafer into dice wherein the wafer has a face upon which a first set of parallel grooves crosses a second set of parallel grooves, the method comprising the steps of

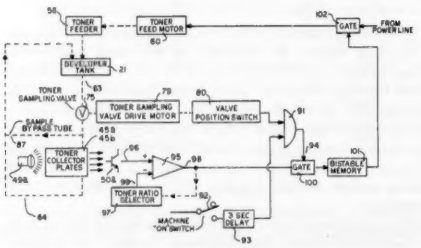
1. placing the wafer with its scribed face down on a sheet of stretchable material to which the wafer is adherent,
2. providing a resilient mat beneath the stretchable sheet,
3. applying pressure upon the upper face of the wafer along the scribed grooves of the first set to cause the wafer to fracture along the grooves and break into strips,
4. stretching the sheet to cause the facing edges of adjacent strips to be spaced apart with their scribed grooves in alignment,
5. and thereafter applying pressure upon the upper faces of the spaced apart strips along the aligned scribed grooves to break the strips into dice.

3,870,197

XEROGRAPHIC TONER CONCENTRATION CONTROL APPARATUS

James Edward Landrith, Wharton, N.J., assignor to Van Dyk Research Corporation, Whippany, N.Y.

Division of Ser. No. 227,978, Feb. 22, 1972, Pat. No. 3,777,173. This application June 21, 1973, Ser. No. 372,054
Int. Cl. B05b *5/02*; **G03g** *15/00*
U.S. Cl. 222—52 **33 Claims**



1. Apparatus for controlling the toner concentration in the developer of a xerographic copying apparatus, comprising:

a toner collecting plate;

supply means for periodically providing a stream of said developer, said supply means including a developer sample chamber, and an orifice communicating with said chamber for limiting the rate of flow of the developer in said stream;

a supply conduit for transporting said developer to said chamber from the developer tank of said copying apparatus;

a valve element comprising a rotatable vane within said chamber for permitting developer to enter said chamber from said supply conduit during a first recurrent time interval and for permitting developer to leave said chamber through said orifice during a second recurrent time interval;

a valve drive motor for rotating said vane;

means for directing said periodic stream onto a surface of said collecting plate to (i) cause toner particles to be dislodged from the developer carrier granules to which the particles are electroscopically adherent to deposit a layer of toner on at least a portion of said collecting plate and (ii) remove toner from said collecting plate portion when the concentration of toner in said periodic stream decreases;

means for sensing the amount of toner deposited in the form of said layer on said collecting plate portion during intervals when said stream is not impinging on said collecting plate; and

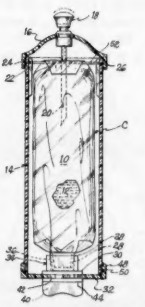
control means coupled to said sensing means for varying the concentration of toner in the developer within said tank in accordance with the amount of toner deposited in the form of said layer on said collecting plate portion.

3,870,198

TWISTABLE BAG TYPE DISPENSER

Milton J. Cohen, 9201 Persimmon Tree Rd., Potomac, Md. 20854

Filed Aug. 13, 1973, Ser. No. 387,706
Int. Cl. B65d *35/56*
U.S. Cl. 222—105 **4 Claims**



1. In a bag type fluid or paste dispenser, a rigid enclosure having a dispensing valve at one end, a bag filled with the fluid or paste to be dispensed extending lengthwise within the enclosure in which the bag is formed of a flexible material which is impervious to the material being dispensed, means communicating the interior of one end of the bag with the dispensing valve, means stabilizing the one end of the bag against turning movement relative to the enclosure comprising an arm extending laterally from the upper end of the bag and an abutment fixed to the enclosure to extend into the path of the arm, and means operatively engaging the other end of the bag for turning the bag in one direction and to block turning movement of the bag in the opposite direction comprising a turntable supported in the bottom wall for rotational movement relative to the enclosure; male and female members one of which is fixed to the end of the bag while the other is fixed to the turntable for twisting the bag in response to turning move-

ment of the turntable; and rake teeth in the adjacent peripheral surfaces between the turntable and bottom wall to enable override during turning movement in one direction while blocking turning movement in the opposite direction.

3,870,199

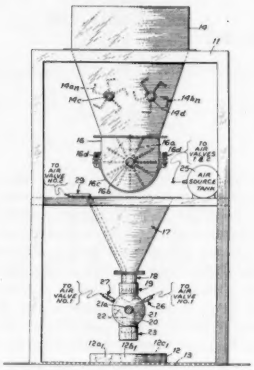
DEPOSITING APPARATUS

William H. Dugger, Kansas City, Kans., and Wayne K. Alexander, Kansas City, Mo., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 176,459, Aug. 31, 1971, Pat. No. 3,757,833. This application Mar. 12, 1973, Ser. No. 340,124

Int. Cl. G01f *11/24*

U.S. Cl. 222—189 **8 Claims**



1. Material depositing apparatus comprising:

a housing having an entrance and exit port;

material dispensing means positioned adjacent said entrance port for dispensing a material into said entrance port;

a drum mounted coaxially in said housing for rotational movement, said drum having branches defining a Y-shaped bore with each branch of said bore being spaced approximately 120° in a plane perpendicular to the drum axis;

means coupled to said housing to assist the filling of said bore and depositing of said material from said bore; and

means for intermittently rotating said drum so that one branch of said bore communicates first with said entrance port to fill said Y-shaped bore with said material and then another branch of said bore communicates with said exit port for depositing said material from said Y-shaped bore.

3,870,200

VALVELESS DISPENSER FOR FLUENT MASSES

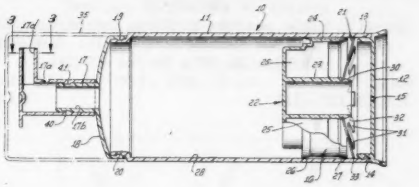
Walter B. Spatz, Pacific Palisades, Calif., assignor to Spatz Corporation, Venice, Calif.

Filed May 14, 1973, Ser. No. 360,180

Int. Cl. B65d *37/00*

U.S. Cl. 222—206 **11 Claims**

1. In a dispenser: a container; a viscous fluent mass in said container; said container having a forward continuously open elongate discharge outlet; piston means in said container movable in a forward direction toward the outlet and against the mass in the container; means for restricting movement of said piston means in a rearward direction away from said outlet at all axial positions of said piston means in said container while permitting movement of said piston means in the container in the forward direction; means for reducing the volume of the container forwardly of the piston means to dispense a portion of the mass through said open discharge outlet; means for then increasing the volume of the container forwardly of the piston means to produce a partial vacuum in said container forwardly of said piston means; the cross-sectional area of said outlet and the length of said open outlet



being so related to the viscosity of said fluent mass that said partial vacuum is incapable of effecting significant withdrawal of said mass back into said outlet, whereby air at atmospheric pressure moves said piston means forwardly in said container toward said outlet.

3,870,201

DEVICE FOR DISPENSING OF A PASTE PRODUCT

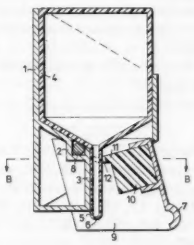
Alf Ake Asplund, Kristinehamn, Sweden, assignor to Industrikompaniet, Kristinehamn, Sweden

Filed Jan. 29, 1973, Ser. No. 328,474

Claims priority, application Sweden, Aug. 12, 1971, 10270/71

Int. Cl. B65d *37/00*

U.S. Cl. 222—207 **3 Claims**



1. Apparatus for dispensing of a paste product, said apparatus comprising

a. a container having an elastic outlet tube, said elastic outlet tube normally receiving paste from said container and adapted to be pressed to have paste expelled therefrom through an opening therein,

b. a casing for receiving said container, said casing having an abuting member abuting said container outlet tube,

c. means for pressing said elastic outlet tube against said casing abuting member for expelling paste therefrom without damage thereto, said means comprising a push means removably pivotally mounted in said casing and having a contact piece of elastic material disposed therein, said contact piece having a first integral projection of elastic material for engaging said outlet tube and closing off said outlet tube against said abuting member, whereby said projection engages and closes off said outlet tube and then said contact piece of said push means presses said outlet tube to expel paste therefrom, and

d. means for biasing said push means to a position wherein said outlet tube is not pressed but is free to receive paste from said container, said means comprising a pair of second projections of elastic material extending from and integral with said contact piece and straddling said first projection and said outlet tubing, each of said projections

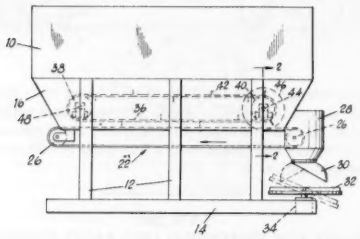
having a free end thereof engaging said abuting member of said casing.

3,870,202

SPREADER WITH AGITATOR TO BREAK UP MATERIAL BRIDGING

Harold A. Skibbe, and John H. Skibbe, both of Sodus, Mich., assignors to Skibbe Manufacturing Co., Inc., Sodus, Mich.

Filed Jan. 28, 1974, Ser. No. 437,291
Int. Cl. A01c *19/00*
U.S. Cl. 222—226 **5 Claims**



1. In a spreader for agricultural materials having a material receiving hopper with a driven material feed belt in the bottom thereof,

means for breaking clods and bridges in the material being fed comprising a chain loop located near the bottom of said hopper and having material breaking tines secured thereto at spaced intervals around said chain loop,

sprockets on shafts supporting said chain loop,

a drive sprocket on one of said shafts drivingly engaged with said feed belt,

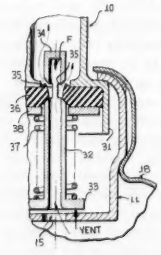
and bearings for the ends of said shafts supported on the sides of said hopper.

3,870,203

AEROSOL DISPENSING VALVE

Henry E. Frankenberg, Boca Raton, Fla., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 17, 1974, Ser. No. 470,977
Int. Cl. B65d *83/14*
U.S. Cl. 222—397 **8 Claims**



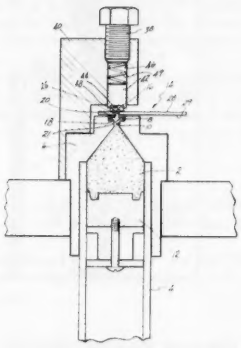
1. An aerosol dispensing valve comprising a valve housing having upper and lower axially spaced walls, an aperture in each wall, a tubular stem having axially opposite ends, a first open end of said tubular stem being seated upon said lower wall aperture with said lower wall aperture and an interior chamber of said tubular stem being in fluid communication, a second end remote from said first end being closed by an end wall, a venting and dispensing port in said tubular stem between said first and second ends thereof, sealing means normally closing said port, a dispensing nozzle surrounding said tubular stem second end, said dispensing nozzle having a shoulder, and means normally biasing said sealing means against said shoulder and into seating relationship with said port whereby said port is normally closed yet can be opened and vented to atmosphere by axial motion of said tubular stem under the influence of a pressurized medium acting against said tubular stem end wall.

3,870,204

APPARATUS FOR THE AUTOMATIC CHARGING OF PRIMER MIX

Edward A. Staba, Killingworth Rd., Higganum, Conn. 06441

Continuation-in-part of Ser. No. 253,481, May 15, 1972, Pat. No. 3,820,578. This application Mar. 25, 1974, Ser. No. 454,053
Int. Cl. G01f *11/00*
U.S. Cl. 222—262 **2 Claims**



1. An apparatus for automatically forming a precisely measured charge of an extrudable priming composition, said apparatus comprising:

a. extrusion means for extruding the priming composition through an orifice, said extrusion means including an extrusion block having a cavity, a grommet freely movably mounted in said cavity, said grommet having a bore therethrough forming the orifice;

b. transfer means for transferring a predetermined volume of the priming composition from said extrusion means to a point offset therefrom, said transfer means including means forming at least one measuring chamber for containing a measured amount of the priming composition, said transfer means being disposed in sliding engagement with an outer surface of said grommet and said grommet being biased into snug engagement with said transfer means by pressure applied to said grommet by the priming composition; and

c. means for moving said transfer means to move said measuring chamber from a position aligned with said orifice to a position offset from said orifice and return.

3,870,205

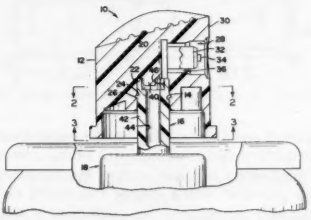
VARIABLE SPRAY RATE AEROSOL

Russell J. Bucaro, Schaumburg, Ill., assignor to Sequist Valve Company, Cary, Ill.

Filed Nov. 23, 1973, Ser. No. 418,781
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.17 **9 Claims**

1. A variable spray aerosol system for use with an aerosol dispenser, said variable spray aerosol system comprising: a button and valve stem combination, said button comprising a

button body including at least one terminal orifice recess formed in the side wall thereof, a valve stem recess formed in the bottom thereof and feed supply channel means extending between said terminal orifice recess and said valve stem recess, said button body further including a key means formed thereon, said valve stem including keyway means disposed in operative engagement with said key means and further including feed passage means extending longitudinally along the interior of at least a portion of said valve stem, said valve stem further including at least a first and second feed supply passage, said feed passage means disposed in fluid communication between said dispenser interior and said one terminal orifice insert via said first and second supply passage and said feed supply channel means, said button body movable between at least a first and second position relative to said valve stem, said first and second feed supply passage disposed to alternately communicate with said feed supply channel means, said first feed supply passage communicating with said feed supply channel means when said button body is in said first position and said second feed supply passage communicating with said feed supply channel means when said button body is in said second position.



3,870,206

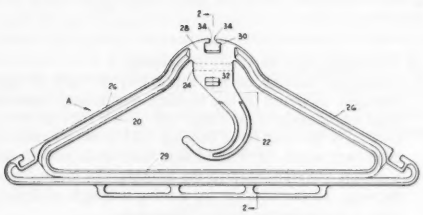
GARMENT HANGER FRAME HAVING A HINGED HOOK

Irvin Feinberg, Saddle Brook, N.J., assignor to Presto Lock Company, Garfield, N.J.

Filed Sept. 25, 1972, Ser. No. 291,926

Int. Cl. A47j *51/097*

U.S. Cl. 223—88 **5 Claims**



1. A one-piece molded plastic garment hanger or the like comprising a substantially rigid supporting frame having a pair of garment supporting arms extending from a central portion, a substantially rigid hook, hinge means connecting the hook to the supporting frame, the hinge means being a flexible section having a thickness less than the thickness of the hook, the hinge means having an axis of rotation extending substantially parallel to the plane of the supporting frame, the hook being rotatable perpendicularly to the plane of the supporting frame from a first position where it is entirely within the perimeter of the supporting frame to a second position where it is outside the perimeter and substantially parallel to the plane of the supporting frame, the central portion having an upwardly open slot, and the hook having stud means dimensioned to enter and to be frictionally held in the slot when the hook is in said second position.

3,870,207

DEVICE FOR MAKING RADIALLY EXTENDING MOTIFS OF TEXTILE FIBERS

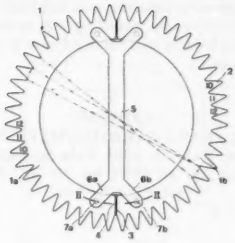
Francoise Gosse, Nord, France, assignor to Societe En Commandite Par Actions: Etablissements M. Caulliez Et Delaoutre, Tourcoing, France

Filed Jan. 7, 1974, Ser. No. 431,049

Claims priority, application France, Apr. 25, 1973, 73.14994

Int. Cl. A41h *43/00*

U.S. Cl. 223—46 **7 Claims**



1. A device for making radial motifs in textile fibers comprising, an annular support projections disposed on said support in at least one circle concentric thereto, the annular support being comprised of a ring of semi-rigid thermoplastic material having radial projections on the periphery thereof situated in the plane of the ring and arranged thereabout, said ring having a pair of slots across one of its diameters through a portion of its thickness, the resulting slots leaving, on one surface of the ring, a continuous thickness of material sufficient to ensure connection of the two half-rings while forming a simple hinge, a bar adapted to cross the ring diametrally, studs projecting from ends of the bar, and two holes being formed, one on either side of each slot to receive frictionally, the studs projecting from the ends of the bar.

3,870,208

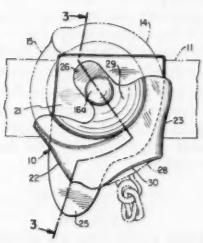
HANDCUFF CASE

Paris Theodore, New York, N.Y., assignor to Seventrees, Ltd., New York, N.Y.

Filed Dec. 5, 1973, Ser. No. 421,973

Int. Cl. A45c *11/00;* **F41c** *33/02*

U.S. Cl. 224—2 F **8 Claims**



1. A handcuff case comprising:

a piece of sheet material having a belt loop portion, a medial portion adjacent said belt loop portion and a handcuff-enclosing portion adjacent said medial portion, means for fastening said medial portion and a first part of said handcuff enclosing portion so as to form a pocket to enclose the lock portions of a set of handcuffs while leaving the frame and jaw portions of the handcuffs exposed to the grasp of the user;

a snap fastener having a first part and a second part releasably fastenable to said first part, said first part of said snap fastener being mounted on said medial portion of said sheet material, said second part of said fastener being mounted on an opposing part of said handcuff-enclosing portion for releasably fastening said handcuff-enclosing portion to said opposing part of said medial portion of said sheet material through the center of said handcuffs so as to retain the lock portions of the handcuffs in said pocket but allow the handcuffs to be withdrawn from said handcuff case by pulling the lock portions through said first and second parts of said snap fastener; and

means for releasably fastening said belt loop portion of said sheet material to said medial portion to form a belt loop for securely holding said handcuff case in position on the belt of a wearer.

3,870,209

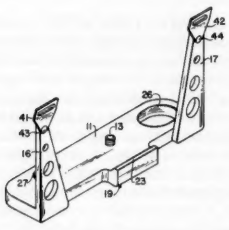
CAMERA CARRYING DEVICE

Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262

Filed July 30, 1973, Ser. No. 383,766

Int. Cl. A45f *5/00*

U.S. Cl. 224—5 V **4 Claims**



1. A device for carrying a camera having a body including a bottom and a lens mounting part extending forwardly of said body comprising:

a base plate adapted for underlying and attachment to said camera bottom for protection of said body;

means for demountably fastening said plate to said camera bottom;

a pair of upright arms secured to and extending generally perpendicularly from said plate;

a neck strap connected to the upper ends of said arms for free hanging support of said device and camera from the neck of the user with said plate underlying and supporting the bottom of the camera body; and

said plate being formed with an integrally forwardly projecting portion medially between said arms and projecting forwardly of said arms and being formed to underlie, engage and support said camera lens mounting part for preventing flexing of said camera body thus maintaining proper optical alignment of said body with a lens mounted on said part.

3,870,210

CONTAINER UNIT FOR AN AUTOMOBILE

Earl M. Trammell, Jr., c/o E.M.T. Enterprises, Box 435, St. Louis, Mo. 63166

Filed Oct. 5, 1973, Ser. No. 404,027

Int. Cl. B60r *7/04*

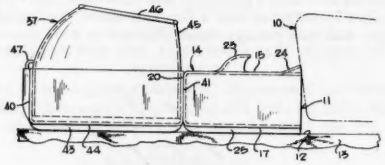
U.S. Cl. 224—42.45 R **9 Claims**

1. A convenience container unit for attachment in an automobile having a support surface and an abutment surface disposed angularly to the support surface, the unit comprising:

a. a container adapted to seat on the support surface adjacent the abutment surface,

b. resilient means detachably connected to the container and located between the container and the support surface,

c. an anchorage means connects the resilient means to the support surface in front of the abutment surface, the resilient means exerting a pull on the container for holding the container against the abutment surface, and



d. a second container seating on the support surface adjacent the first said container, one of the containers being provided with a top-open socket, and the other container being provided with a tongue interfitting the socket to detachably connect the two containers in tandem.

3,870,211

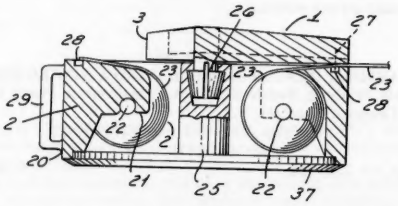
MULTIPLE TAPE DISPENSER

Fred G. Schriever, 19950 Harper Woods, Harper Woods, Mich. 48225

Filed Mar. 14, 1974, Ser. No. 450,999

Int. Cl. B26f *3/02*

U.S. Cl. 225—34 **7 Claims**



1. A multiple tape dispenser comprising;

a cylindrical housing having a plurality of reels of tape rotatably mounted in the housing and spaced apart in fixed relationship to each other, the axis of the reels being chordal to the cylindrical housing, said housing having an edge over which the housed tape may be dispensed; and a cutting means affixed to the housing and located near the edge of the housing for cutting a length of desired tape at the point the tape is dispensed.

3,870,212

FOIL DISPENSER

Isaac H. Polk, Santa Clara, Calif., assignor to Harold C. Kuhn, San Francisco, Calif., a part interest

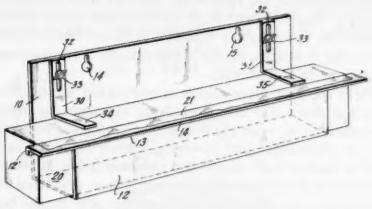
Filed Mar. 18, 1974, Ser. No. 451,856

Int. Cl. B26f *3/02*

U.S. Cl. 225—42 **6 Claims**

1. A dispensing holder for foil packaged on a roll within a box of square cross-sectional shape, comprising an elongated structure of substantially uniform cross-sectional shape throughout its length having a rectilinear pocket adapted to receive the foil package, said pocket being formed by a back side, bottom side, a third side and at least a pair of cross-bar means each pivotally mounted on one of said sides so as to, in its normal position, extend across the fourth side of the recti-

linear pocket, a ledge extending horizontally beyond the area of the pocket on the side adjacent the free end of the pivotal



means, said ledge having a cutting edge at the free end thereof.

3,870,213

APPARATUS FOR SEPARATING AND STACKING BLANKS

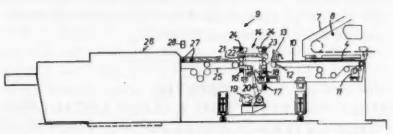
Geroges Meylan, Preverenges, Switzerland, assignor to J. Bobst & Fils S.A.

Filed Mar. 2, 1973, Ser. No. 337,656

Claims priority, application Switzerland, Mar. 17, 1972, 3345/72

Int. Cl. B26f *3/00*

U.S. Cl. 225—100 **11 Claims**



1. Separating and stacking apparatus for a plurality of interconnected box blanks formed from a single sheet, comprising an input conveyor, a separating conveyor juxtaposed with said input conveyor for accepting sheets therefrom, said separating conveyor operating at a linear speed greater than the speed of said input conveyor whereby blanks are separated from said sheet by said separating conveyor, and a plurality of divertor stations juxtaposed with said separating conveyor downstream from the place at which said blanks are separated from each other, each of said divertor stations having a divertor gate, and means for operating all of said divertor gates simultaneously for selectively simultaneously diverting individual blanks from a path aligned with the direction of movement of said separating conveyor into a plurality of stacks.

3,870,214

WEB TENSIONING DEVICE

Jurg Friedrich Schmid, Gumligen, Switzerland, assignor to Maschinenfabrik Wifag, Bern, Switzerland

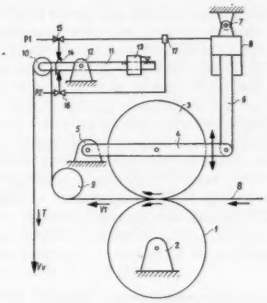
Filed Feb. 26, 1974, Ser. No. 446,012

Claims priority, application Sweden, Feb. 27, 1973, 7302756

Int. Cl. B65h *25/04*

U.S. Cl. 226—34 **6 Claims**

1. Web tensioning device for regulating the tension of a web of material, such as a web of paper, to a constant value, characterized in that a pair of feed rolls are disposed in contacting relationship and arranged to provide a bite through which the web can be passed, a first bearing mounted in a fixed position, one of said feed rolls fixed in said first bearing and arranged to be driven so that its surface speed corresponds substantially to the processing speed of the material web, a second bearing mounted in a fixed position, a first lever pivotally mounted on said second bearing, the other said feed roll being mounted on said first lever, a third bearing mounted in a fixed position, a piston assembly including a piston rod secured to said third bearing with said piston rod connected to said lever, a guide roll spaced from the pair of said feed rolls and arranged for the web of material to pass over said guide roll after passing through the bite formed by said feed rolls, a measuring and storage roll spaced downstream of said guide roll in the direction of movement of the web of material so that the web passes over it, a fourth bearing mounted in a fixed position, a second lever pivotally mounted on said fourth bearing, said measuring



and storage roll mounted on said second lever, a member mounted on said second lever for applying an adjustable force thereto in accordance with the constant web tension value, a regulating means operatively associated with said lever and in operative communication with said piston assembly for maintaining the constant value of web tension by continuously adjusting said piston assembly which adjustment is conveyed to the other said feed roll over said first lever for maintaining the constant web tension value.

3,870,215

SUSPENSION LOOP DAMPER FOR HEAVY WEBS

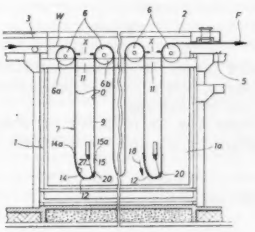
Gunther Schiffer, Dusseldorf, Germany, assignor to Fa. Kleinewefers Industrie-Companie GmbH, Krefeld, Germany

Filed Mar. 29, 1973, Ser. No. 346,060

Claims priority, application Germany, Apr. 7, 1972, 2216666

Int. Cl. B65h *23/22*

U.S. Cl. 226—42 **16 Claims**



1. A suspension loop damper for a traveling web of material such as carpet or the like comprising in combination:

first and second rotatable carrier rollers arranged so that the web passes over the top of said rollers and depends in a free hanging loop therebetween;

a damper means positioned for engaging the outer surface of the loop laterally of the lowermost point of the loop and movable therewith;

and means movably supporting the damper so that it moves with change in length of the loop between the rollers.

3,870,216
DATA RECORDERS

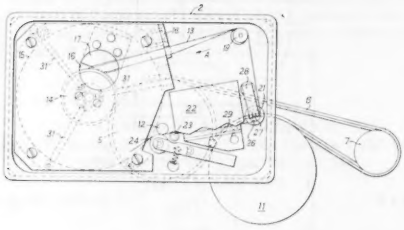
Frank Richard Towner, Wokingham, and John Robert Snook, Bracknell, both of England, assignors to Sperry Rand Limited, London, England

Filed Sept. 10, 1973, Ser. No. 396,030

Claims priority, application Great Britain, Sept. 29, 1972, 45021/72

Int. Cl. B65h *17/20*

U.S. Cl. 226—181 **6 Claims**



1. A data recorder comprising a tape deck having a capstan operable to drive a recording medium in the form of a tape, and drive means operable to drive the capstan, the drive means comprising a motor drivingly connected to the capstan through flywheel means comprising a pair of flywheels which in use are arranged to rotate in opposite directions, wherein the tape is in the form of a continuous loop wound on a reel, wherein the capstan is located closely adjacent the point of return of the tape to the reel and wherein a removable generally cylindrical cover is provided for the reel, the cover having an annular top and a cylindrical body with two spaced slots in the cylindrical body portion thereof through which respective portions of the tape extend in passing from the reel over guides and magnetic heads and back to the reel, both slots being open on the bottoms thereof to permit the slots encompass the respective portions of the tape as the cover is installed over the reel and to permit removal of the cover from the reel with the respective portions of the tape passing through the open bottoms of the slots as the cover is removed, the cover also having an aperture in the top thereof across part of which extends a first guide member for the tape operable to guide the plane of the tape through substantially 90°, said tape and first guide member being manually accessible through said aperture.

3,870,217
DATA RECORDERS

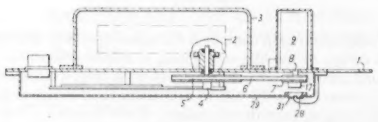
Frank Richard Towner, Wokingham, and John Robert Snook, Great Hollands, both of England, assignors to Sperry Rand Limited, London, England

Filed Sept. 10, 1973, Ser. No. 396,029

Claims priority, application Great Britain, Sept. 29, 1972, 45021/72

Int. Cl. B65h *17/22*

U.S. Cl. 226—188 **8 Claims**



1. A data recorder comprising a tape deck having a recording medium in the form of a tape which is drivable by first drive means, in a recording mode, at one speed and drivable by second drive means, in a replay mode, at a different speed, the first and second drive means being operable to drive the tape through common drive elements and the arrangement being such that when the second drive means is in a driving position relative to the tape deck, the first drive means automatically is disconnected from the common drive elements, and when the second drive means is removed from its driving position, the first drive means automatically is reconnected to the common drive elements,

wherein the first drive means is connected to and disconnected from the common drive elements by relative movement between the first and second drive means such as to disconnect and connect, respectively, the second drive means from and to the common drive elements,

wherein the first drive means is operable to drive one of the common drive elements through movable means biased into an operative position and movable by the second drive means into an inoperative position,

wherein the movable means is a spring-loaded ball which in the operative position connects said one common drive element to the first drive means and in the inoperative position disengages said one common drive element from the first drive means,

wherein the first drive means is a motor having an output shaft, and said one common drive element is a pulley mounted on said output shaft by a ball race and carrying the spring-loaded ball, the output shaft being provided with a member having a recess into which the ball projects in its operative position,

wherein the second drive means is a motor having an output shaft to which is connected an attachment comprising a shaft, a sleeve keyed to the latter, and a plunger carried by the sleeve and releasably engageable with a recess in the pulley to provide a drive connection between the second drive means and the pulley.

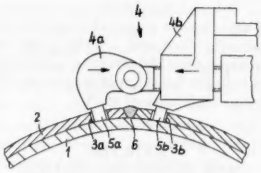
3,870,218
DEVICE FOR EFFECTING A CLOSE ENGAGEMENT BETWEEN LAYERS OF SHEET METAL WHEN MAKING LAMINATED PRESSURE CONTAINERS

Joachim Ehle, Essen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 21, 1973, Ser. No. 389,651

Int. Cl. B23k *1/00, 37/04*

U.S. Cl. 228—4 **1 Claim**

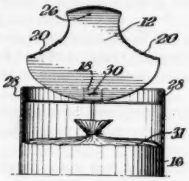


1. A device for making a cylindrical pressure container by means of a core pipe and at least one sheet metal layer to be placed therearound and provided with two rows of bores respectively arranged near the end edges of said sheet metal layer, which includes: first supporting means, a first series of studs pivotally supported by said first supporting means for engagement with one of the rows of bores in said sheet metal layer, second supporting means movable selectively relative toward and away from said first series of studs, a second series of studs pivotally supported by said second supporting means for engagement with the other row of bores, and means operatively connected to said first and second supporting means for actuating the same.

3,870,219
TUBULAR CARTON

Howard Reisman, c/o J. Reisman & Sons, Rt. 138, Pennsauken, N.J.

Continuation-in-part of Ser. No. 302,264, Oct. 30, 1972, Pat. No. 3,820,865. This application Jan. 31, 1973, Ser. No. 328,479
Int. Cl. B65d *3/04, 3/26*
U.S. Cl. 229—4.5 **14 Claims**

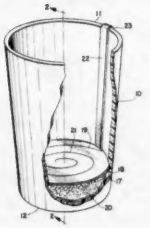


1. A tubular carton comprising a tubular wall of fairly stiff flexible sheet material having a predetermined end configuration, end closures of fairly stiff flexible sheet material having a predetermined configuration of a slightly smaller diameter than the inner end configuration of said tubular wall, peripherally spaced tabs about said end closures, said end closures being inserted within said end configuration of said tubular wall with said tabs being bent to lie contiguous to said ends, fastening means securing said tabs within said ends, and at least one of said end closures having a segment severable from its main portion about at least all but one of said tabs whereby said main portion may be swung clear of said tubular wall about its fastened tab after the segments about all of said tabs except said fastened tab are severed for providing access to said carton and may be swung back about said fastened tab into engagement within said tubular wall to reclose said carton.

3,870,220
CUP WITH BEVERAGE CONCENTRATE CONTAINER

Ronald William Koury, 18 Luttrel Ave., Toronto, Ontario, and Marvin Cooper, 18 Fisherville Ave., Downsview, Ontario, both of Canada

Filed Feb. 7, 1973, Ser. No. 330,228
Int. Cl. B65d *3/00*
U.S. Cl. 229—1.5 C **3 Claims**



1. A beverage cup for dispensing a single portion of a beverage, from a beverage concentrate contained within the cup, said cup comprising;

a drinking receptacle, of sufficient size to contain a single serving of a liquid beverage, said receptacle having a bottom and side walls, said side walls defining a rim, said side walls of said receptacle defining an upper and a lower portion, said upper portion being of a predetermined thickness and said lower portion being of a reduced thickness with respect thereto, whereby to define an inner annular shoulder running around the interior of said receptacle adjacent to but spaced above said bottom wall thereof, at the junction between the lower and upper wall portions the outer surface of said receptacle side walls being smooth and regular;

a container for said beverage concentrate secured in the bottom of said receptacle, said container containing a single serving of a beverage concentrate, and being formed with a bottom, side walls, and an open top accessible to the interior of said receptacle;

a peripheral lip running around the open top of said container and dimensioned to fit within said lower side wall portion of said receptacle and be retained therewithin by interengagement with said annular shoulder, said container being formed of a material which is harmless when immersed in said liquid beverage, and being secured as aforesaid in said bottom of said receptacle to prevent removal thereof upon opening thereof;

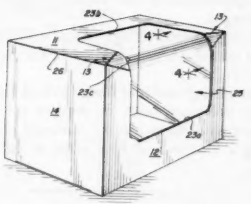
closure panel means extending over the open top of said container, and sealably fastened therearound, and,

tab means connected to said closure panel, whereby said closure panel may be removed from said container while said container remains secured in the bottom of said receptacle thereby exposing said beverage concentrate within said container at the bottom of said receptacle, the receptacle then being readied for the addition of liquid without removal of said container.

3,870,221
FOLDING CARTON

Charles R. Zeitter, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Oct. 9, 1973, Ser. No. 404,607
Int. Cl. B65d *5/18*
U.S. Cl. 229—16 D **7 Claims**



1. A folding carton comprising a plurality of panels separated from one another by a plurality of foldlines, at least one pair of adjacent panels and the foldline connecting same having an enlarged window opening formed therein; and a bendable window member overlying said opening and having the margin of said member overlapping and being secured to the concealed surfaces of said panels and foldline cicumjacent said window opening; said opening separating said foldline into opposed aligned sections, each foldline section including a pair of scorelines extending laterally outwardly and convergently from the perimeter of the opening and intersecting one another at a point spaced laterally outwardly from the periphery of said window member.

3,870,222
COMBINATION REUSABLE CARTON AND LIFT-OUT CARRY TRAY FOR PAPER AND THREE-WAY COVER

Ralph R. Butler, Erie, Pa., assignor to Hammermill Paper Company, Erie, Pa.

Filed July 11, 1972, Ser. No. 270,868
Int. Cl. B65d *5/66*
U.S. Cl. 229—44 R **6 Claims**

1. In combination, a carton and a cover, said cover being adapted to be released at the front to be used as a swinging

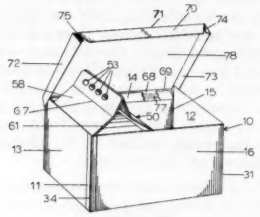
cover and selectively to be detached both front and back providing a removable cover to be removed and used as a carrying tray,

said carton having a bottom, a front wall, a rear wall, a first end wall and a second end wall defining an enclosure,

said front wall, said first end wall, said second end wall and said rear wall rising upwardly from said bottom and terminating at upper edges all disposed at substantially the same distance from the said bottom,

said cover having a front flange, a rear flange, a first end flange, a second end flange, and a smooth one-piece top, said top being of substantially the same area as said carton bottom,

said flanges being fixed to said top and extending downward therefrom,



said flanges having extensions from said top downwardly of substantially less than half the extension of said walls of said carton upwardly from said bottom,

said flanges being fixed together at the adjacent edges,

a scored line extending across said rear wall of said carton parallel to the top of said rear wall defining a hinge flap, said scored line being spaced below said rear wall top edge approximately the distance equal to the width of said flanges,

means fixing said rear flange of said cover to said hinge flap of said carton whereby said cover can be used as a swinging cover,

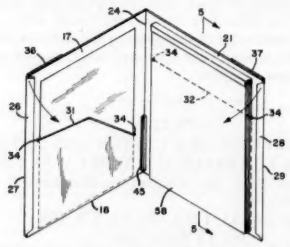
said means fixing said rear flange to said hinge flap comprising an adhesive weak in tension yet strong in shear whereby said cover can be removed and used as a tray having a bottom and four sides to carry two reams of paper.

3,870,223

DOUBLE WING POCKET PORTFOLIO AND FILE FOLDER

Jon Richard Wyant, Marietta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 7, 1974, Ser. No. 431,355
Int. Cl. B65d *27/08*
U.S. Cl. 229—72 **17 Claims**



1. A twin pocket portfolio and file folder formed from a single, integral blank, comprising:

a. a front outer panel,

b. a rear outer panel hingedly connected to said front outer panel along a first center fold line,

c. a front inner panel facing said front outer panel and connected thereto along a first bottom fold line on an edge of said front outer panel adjacent the edge on said first center fold line, said facing front panels forming a front pocket in said portfolio,

d. a rear inner panel facing said rear outer panel and connected thereto along a second bottom fold line forming an extension of said first bottom fold line, and hingedly connected to said front inner panel along a second center fold line forming an extension of said first center fold line, said facing rear panels forming a rear pocket in said portfolio,

e. means attaching said front outer panel to said front inner panel along the respective edges thereof opposite said center fold lines,

f. means attaching said rear outer panel to said rear inner panel along the respective edges thereof opposite said center fold lines,

g. said front and rear inner panels being longer along said second center fold line than said front and rear outer panels along said first center fold line to lengthen said inner panels with respect to said outer panels to define respective front and rear exterior file folders opening into said front and rear pockets opposite said bottom fold lines, said shorter front and rear outer panels providing ready access to said exterior file folders, and

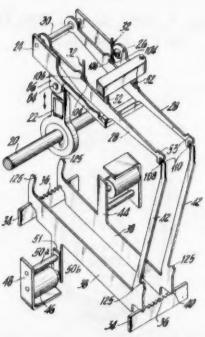
h. slit means in said front and rear inner panels providing access through said inner panels to said respective front and rear pockets for reception, filing, storage, and support therein of papers, notepads, envelopes and so on.

3,870,224

TAPE PERFORATOR

Leon N. Canick, Fresh Meadows, and Charles S. Aldrich, St. James, both of N.Y., assignors to Precision Mechanisms Corporation

Filed Aug. 6, 1973, Ser. No. 386,215
Int. Cl. G06k *1/02*
U.S. Cl. 234—110 **18 Claims**



1. A tape perforator comprising:

a. a cradle pivotally mounted on a fixed support for oscillating movement about a first transverse axis;

b. drive means for oscillating said cradle about said first axis;

c. a first plurality of elongated lift levers pivotally mounted proximate one end thereof in said cradle for selective oscillating movement about a second, transverse axis that is substantially parallel to and spaced from said first axis;

d. an elongated punch mounted at one end on each said first lever proximate said first axis, the longitudinal axis of

each said punch being substantially perpendicular to said first axis, the axis of said punches being in a plane that is approximately coincidental with said first axis;

e. means for advancing the tape along a plane that traverses the plane of the longitudinal axis of said punches;

f. a second plurality of elongated fulcrum levers equal in number to said first plurality of levers, said second levers being pivotable about axes that are substantially parallel to the planes of said first levers and movable between a first, non-punching mode position and a second, punching mode position whereby, in said first position of said second levers, said cradle and said first levers oscillate as a unit about said first axis and said punches are substantially devoid of movement in directions along the longitudinal axis thereof so that said punches do not perforate the tape and whereby, in said second position, said second levers interfere with the movement of said first levers so that said cradle continues to oscillate about said first axis but said first levers oscillate about said second axis to cause said punches to move longitudinally above the plane of and through the tape; and

g. means for selectively moving said second levers from said first position to said second position.

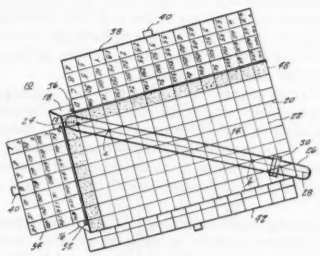
3,870,225
VARIABLE LINEAR GRAPH

John E. Murphy, 11 Phyllis Dr., Bethpage, N.Y. 11714

Continuation-in-part of Ser. No. 299,829, Oct. 24, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,258

Int. Cl. G06c *3/00*

U.S. Cl. 235—89 R **10 Claims**



1. In a variable linear graph, the combination of rectangular case means having a horizontal top surface portion and vertical side portions, at least two of said side portions being orthogonally adjacent to each other thereby establishing an ordinate side and an abscissa side, each of said two side protions containing therein pocket means, on said surface portion there being first and second sets of lines intersecting each other to form an orthogonal graph arrangement of ordinate and abscissa lines having an origin at one corner thereof, at least one each of an ordinate card and an abscissa card, each of said cards respectively including at least one scale thereon, the divisions of the scale of said ordinate and abscissa cards corresponding respectively to said ordinate and abscissa lines, said ordinate and abscissa cards being independently insertable into said respective pocket means of said ordinate and abscissa side portions such that the scales thereon are respectively adjacent to said ordinate and abscissa lines, and arm means pivotally attaahed to the surface of said case means at said origin of said graph to rotate on said graph.

3,870,226
COMPACTION OF A SURFACE WITH A COMPACTOR HAVING WHEELS

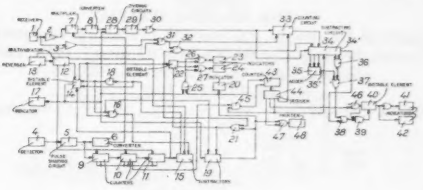
Maurice Leroy, Sotteville les Rouen, France, assignor to Societe anonyme dite: Richier, Paris, France

Filed May 21, 1973, Ser. No. 362,203

Claims priority, application France, May 25, 1972, 72.18773

Int. Cl. G06f *15/56*

U.S. Cl. 235—151.3 **12 Claims**



3. A device for determining the degree of compaction of a surface by a compactor having wheels, in successive sweeps, which comprises:

A. means for providing a signal representative of the torque applied to the wheels during at least a part of each sweep;

B. means for comparing the signals provided during two successive sweeps, and

C. means for determining the degree of compaction as a function of the result of the comparison of said signals.

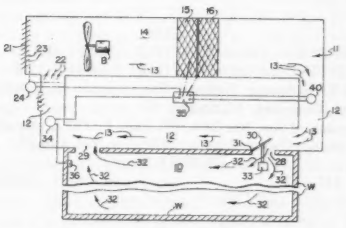
3,870,227
COMFORT TEMPERATURE CONTROL SYSTEM FOR A ZONE

Russell G. Attridge, Jr., Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Aug. 10, 1972, Ser. No. 279,743

Int. Cl. F24f *11/09*

U.S. Cl. 236—49 **4 Claims**



1. A method of controlling temperatures in a zone comprising:

a. providing a fluid tempering system comprising fluid tempering means and a fluid circulating system for directing a given flow of fluid from said tempering means toward the zone and for returning said flow of fluid from said zone towards said tempering means, said system providing for a variable flow of fluid to said zone and for bypassing the remaining fluid of said given flow around said zone;

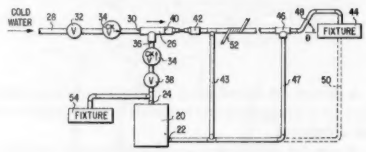
b. sensing the temperature in said zone;

c. altering the flow of fluid to bypass more or less fluid around said zone in response to sensed changes in zone temperature to maintain a predetermined zone temperature level;

d. mixing the fluid which has flowed to the zone with the fluid which has been bypassed around the zone;

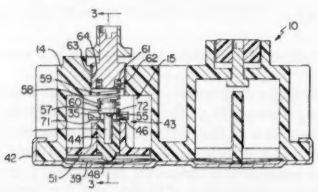
e. sensing the temperature of the mixed zone and bypass fluids to determine the load on said zone;
f. controlling the temperature of said given flow of fluid flowing toward said zone in response to the sensed temperature of the mixed zone and bypass fluids; and,
g. maintaining the flow rate of fluid to the zone relatively constant except when the load on the zone changes substantially and abruptly.

3,870,228
WATER HEATING SYSTEM
Charles D. Moseley, Jr., P.O. Box 449, Lynchburg, Va. 24503
Continuation-in-part of Ser. No. 260,667, June 7, 1972,. This application Jan. 15, 1973, Ser. No. 323,739
Int. Cl. F24d *3/00*
U.S. Cl. 237—59 **9 Claims**



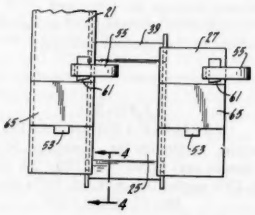
1. A system for supplying heated water at a constant temperature from a source to the inlets of a plurality of fixtures, said system comprising:
a. water heater means having an inlet and an outlet, said outlet providing said source of heated water, and
b. jet entrainer means having a first and second inlet and an outlet, said first inlet being connected to said outlet of said source of heated water, said second inlet being connected between a nozzle and a source of relatively cold water, and said outlet of said jet entrainer being connected to each of said inlets of said plurality of fixtures, said nozzle being positioned in said entraining means for providing a high velocity stream of water which entrains water from said first inlet in proportion to its velocity to thereby maintain the temperature of the water at said outlet of said entrainer means substantially constant.

3,870,229
THERMOSTAT CONSTRUCTION AND ELECTRICAL CONTROL SYSTEM UTILIZING THE SAME
Siegfried E. Manecke, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Continuation of Ser. No. 260,107, June 6, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,893
Int. Cl. H01h *71/16*
U.S. Cl. 337—57 **22 Claims**



1. In a thermostat construction having a fixed contact and a blade-carried movable contact supported by a frame means and bimetallic snap disc carried by said frame means for controlling movement of said movable contact relative to said fixed contact in response to snapped temperature sensing conditions of said disc together with temperature setting means carried by said frame means for selecting the temperature of operation of said disc for moving said movable contact out of contact with said fixed contact, the improvement wherein said blade has opening means passing therethrough and said temperature setting means comprises plunger means passing loosely through said opening means provided through said blade and engaging said snap disc, spring means carried by said frame means and being operatively associated with said plunger means to urge said plunger means into engagement with said snap disc, and means for adjusting the force of said spring means that urges said plunger means into said engagement with said snap disc.

3,870,230
RAILROAD TRACK CONSTRUCTION
Sergio R. Damy, Apartado Postal 39-56, Guadalajara, Mexico
Filed Feb. 4, 1974, Ser. No. 439,099
Claims priority, application Mexico, Mar. 27, 1973, 142462
Int. Cl. E01b *3/16*
U.S. Cl. 238—26 **2 Claims**

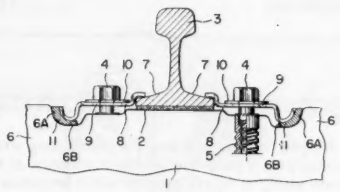


1. A railroad track support including:
a pair of longitudinally extending members spaced laterally of each other a distance apart equal to the desired spacing of the rails of a railroad track,
said longitudinally extending members each including alternately spaced base and rail support portions with said rail support portions projecting above said base portions,
said rail support portion of each longitudinally extending member being aligned with similar portions of the other longitudinally extending member,
at least one cross member extending between and engaging said longitudinally extending members to maintain the lateral spacing of said longitudinally extending members, said cross members including rail support portions,
rail fastening means carried by said rail support members of said longitudinally extending members and said cross member,
said rail fastening means including lugs and clips fastened to said rail support portions on opposite sides of each rail, each clip extending parallel to a track and being spiral shaped with the outer end of said clip fastened to said rail support portion and the inner end equipped with a laterally projecting tab adapted to the forced into engagement with its rail.

3,870,231
RAIL FASTENING DEVICE
Shigetaro Toyama, and Yoshio Matsuo, both of Tokyo, Japan, assignors to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan
Filed July 17, 1974, Ser. No. 489,355
Int. Cl. E01b *9/66*
U.S. Cl. 238—324 **5 Claims**

1. In a rail fastening device coacting between a flange portion of a rail placed on a concrete tie and a stepped portion inclined with respect to said rail and formed on said concrete tie, the fastening device including a fastening member bridged between said stepped and flange portions, whereby the rail is firmly held on the concrete tie by fastening said fastening member with bolts, the improvement comprising a wedge-like member interposed between said fastening member and said

stepped portion, said stepped portion being formed into a configuration so as to have a substantially vertical side surface which progressively approaches the rail and a substantially horizontal upper surface which progressively inclines downwardly in the direction in which said vertical side surface



progressively approaches the rail, said wedge-like member being associated with said stepped portion and having vertically and horizontally extending portions which are shaped to respectively conform with said vertical and horizontal surfaces.

3,870,232

NOZZLE FOR PROJECTING POWDERED SOLID PRODUCTS

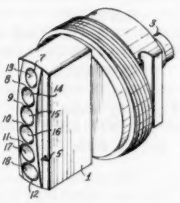
Adrien Lacchia, Meylan, France, assignor to Air-Industrie, Paris, France

Filed Apr. 30, 1973, Ser. No. 355,306

Claims priority, application France, May 26, 1972, 72.19635; Feb. 1, 1973, 73.04028

Int. Cl. B05b *1/04, 5/02, 7/04*

U.S. Cl. 239—15 **8 Claims**



1. A spray nozzle for projecting solid particles carried by a conveyor gas from a spray gun of the type equipped with means for supplying secondary air, said nozzle being adapted to shape the projected particles and said conveyor gas into a single fan-shaped outlet spray, said nozzle comprising:

a nozzle body defining a plurality of separate ducts passing through said body in the direction of said spray, each separate duct having an inlet and a spray outlet and adapted to be completely traversed by a portion of said particles, said plurality of ducts being positioned to form beyond said outlets a spray in which said particles are uniformly distributed, and

a suction device of the venturi type associated with each of said separate ducts, each suction device comprising a constriction at the inlet of the separate duct with which it is associated and at least one injection conduit positioned for discharging auxiliary gas received from sid secondary air supply means into said associated duct downstream of said constriction.

3,870,233

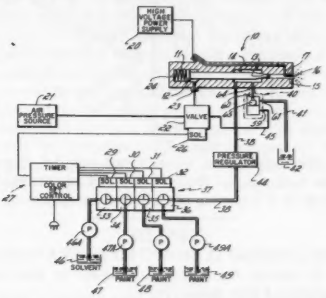
COLOR CHANGE OF ELECTROSTATIC SPRAY APPARATUS

Frederick R. Wilhelm, Avon Lake; Donald R. Hastings, Elyria, and William W. Lyth, Cleveland, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Sept. 12, 1973, Ser. No. 394,422

Int. Cl. B05b *5/02, 7/24, 15/02*

U.S. Cl. 239—15 **27 Claims**



1. An electrostatic spray system for selectively spraying any one of a plurality of spray materials from a common spray gun, which system comprises

a spray gun having a spray material flow passage terminating in an outlet orifice and a selectively operable valve for controlling the emission of spray material from said orifice,

means including a high voltage power supply for applying an electrical charge to spray material as it is emitted from said spray gun,

a plurality of spray material reservoirs and a solvent reservoir,

means including an electrical control circuit for selectively connecting any one of said reservoirs to said spray gun so as to enable spray material to be supplied from a selected reservoir to said gun,

a dump tank, and

a dump valve operatively connected to the spray material flow passage of said gun and operable when opened to bypass spray material from said flow passage to said dump tank, said dump valve being positioned immediately adjacent said gun and made from components which have a capacitance sufficiently low as to preclude said dump valve from storing a potentially dangerous electrical charge,

said dump valve comprising a valve housing, said housing having an inlet port and an outlet port interconnected by a dump flow passage, and

a needle valve element located within said dump flow passage and operable to control the flow of spray material through said dump valve.

3,870,234

LAMINAR FLAME SEPARATE AEROSOL BURNER FOR USE IN ATOMIC ABSORPTION SPECTROSCOPY

Janex Stupar, Ljubljana, Yugoslavia, assignor to Institut Jozef Stefan, Jamova, Yugoslavia

Filed Nov. 6, 1972, Ser. No. 304,269

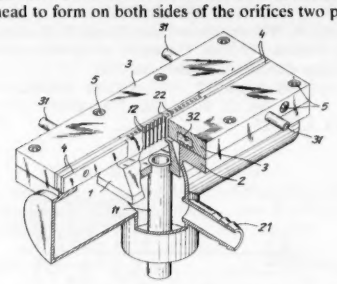
Claims priority, application Yugoslavia, Apr. 11, 1972, 973/72

Int. Cl. B05b *15/00*

U.S. Cl. 239—132.3 **1 Claim**

1. A laminar-flame separate-aerosol-injection burner for use in atomic absorption spectroscopy, comprising an aerosol chamber provided with a plurality of orifices on the upper side and connected by a tube to an aerosol supply, said aerosol chamber being positioned inside a burner body and clamped between two halves of a burner head which are screwed tightly

to the top of the burner body, and that four thin metal spacers are placed between the aerosol chamber and the halves of the burner head to form on both sides of the orifices two parallel

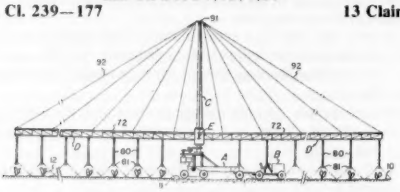


slots for the flame gases, whereat two parallel channels are drilled on each side of the burner head connected by pipe connections to a water supply and drain respectively.

3,870,235
PORTABLE PEDESTAL MOUNTED TOWER IRRIGATOR

Stephen D. Newell, Du Bois, Pa., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Dec. 17, 1973, Ser. No. 425,523
Int. Cl. B05b *3/02, 1/20*
U.S. Cl. 239—177 13 Claims

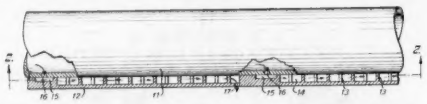


1. In an improved overhead rotary pedestal-supported effluent-dispensing unit, a support base, a primary cage-like support frame of vertically elongated shape secured on said support base, a secondary cage-like rotatable upper support frame of vertically elongated shape, a pipe connector membe. fixedly mounted within a lower end of said primary support frame on said support base and having a coupling at one end thereof for detachably receiving an effluent supply member and having an upwardly open end portion; a vertically elongated and positioned rotatable pipe member extending at its lower end into the upwardly open end portion of said connector pipe member and being journaled therein to extend upwardly within and along said primary support frame into within and along said secondary support frame; a reinforcing sleeve member secured over said vertical pipe member and extending from a position adjacent said pipe connector member centrally vertically upwardly along said primary support frame and at its upper end being secured to and supporting said secondary support frame in a spaced relation above said primary support frame, a bearing sleeve secured within and extending downwardly from an upper end portion of said primary support frame and along said reinforcing sleeve member for journaling said sleeve member along and within said primary support member, end thrust bearing means positioned within the spacing between said primary and secondary support frames and cooperating with said sleeve member for rotatably supporting said secondary frame on and with respect to said primary support frame, a mast extending centrally upwardly from and mounted on an upper end of said secondary support frame, a pair of opposite, substantially horizontally extending, fluid dispensing truss arm assemblies mounted on said secondary support frame to extend substantially horizontally outwardly therefrom, a pair of balanced tension arms extending substantially horizontally from said secondary support frame at right angles to said pair of truss arm assemblies, and cable means connecting said pair of truss arm assemblies and said pair of tension arms together and to an upper end portion of said mast.

3,870,236
DRIPPING IRRIGATION TUBING

Jaime Sahagun-Barragan, Calle del Teco 287, Zamora, Michoacan, Mexico

Filed Mar. 14, 1973, Ser. No. 341,219
Int. Cl. B05b *15/00*
U.S. Cl. 239—542 2 Claims

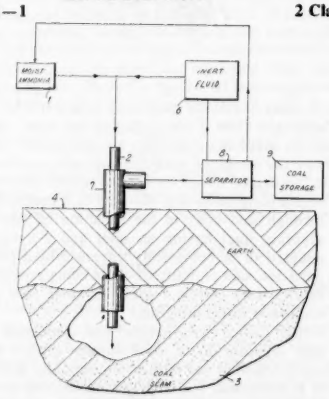


1. A dripping irrigation tubing for distributing irrigation liquid, comprising a pipe line having a plurality of spaced perforations along its length through which irrigation liquid under pressure emerges from the pipe line, and a one piece depressurizing channel member outside the pipe line covering said perforations and extending partly around the external circumference of said pipe line, said channel member having a curved bottom wall corresponding to the pipe line wall curvature and side walls of uniform height extending around the edges of said bottom wall, said side walls being firmly attached to the outside of the pipe line wall to space the channel member from the pipe line, a plurality of cross walls being provided projecting alternately from each of said side walls and of the same height as said side walls and engaging with the outside of the pipe line wall but not reaching the opposite side wall and arranged to form passages providing a plurality of obstacles to liquid flow, and reception chambers for incoming liquid being provided in said channel member located respectively under each pipe line perforation and of less height than said side walls thereby filtering out large particles from the incoming liquid, and including a plurality of spaced outlet holes in said channel member at a preselected distance between said reception chambers along its length to distribute liquid at a predetermined lowered pressure after passing through said passages.

3,870,237
CHEMICAL COMMINUTION OF COAL AND REMOVAL OF ASH INCLUDING SULFUR IN INORGANIC FORM THEREFROM

Robert G. Aldrich, Manilius, N.Y., assignor to Syracuse University Research Corp., Syracuse, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,559
Int. Cl. B02c *19/00*
U.S. Cl. 241—1 2 Claims



1. A method of reducing interlayer forces at natural interfaces present in coal, comprising the step of treating said coal

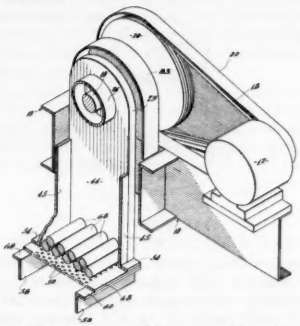
with an effective amount of moist ammonia where the ratio of water to ammonia is up to 72:28 by weight.

3,870,238

SAND FRACTURING APPARATUS AND METHOD

George L. Sellars, Cincinnati, Ohio, assignor to Dravo, Corporation, Pittsburgh, Pa.

Filed Feb. 22, 1973, Ser. No. 334,695
Int. Cl. B02c *17/14*
U.S. Cl. 241—27 **9 Claims**



1. A sand fracturing machine comprising, in combination: an open topped container with a horizontal bottom wall with apertures therethrough and vertical side walls, said apertures being shaped to prevent sand grains from becoming wedged therein and large enough to pass substantially all the sand aggregate introduced into said container, said container being mounted for movement substantially only in a vertical direction;

a plurality of elongated rods disposed within said container with the longitudinal axis of each rod being disposed substantially parallel to said bottom wall, said rods being unattached to said container and free to move in a vertical direction; and

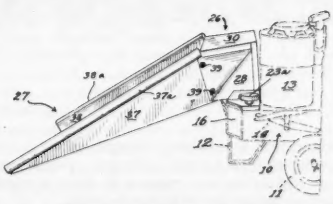
a vibrator apparatus operably connected to said container to vibrate said container and rods in a generally vertical direction wherein the larger grains of sand in a sand aggregate placed into said open topped container are fractured by the vibrating rods to produce a greater percentage of mid-size sand grains in the output sand aggregate of the machine than is contained in sand aggregate introduced into the machine without substantially increasing the percentage of fine sand grains in the output sand aggregate.

3,870,239

DETACHABLE LOADING DEVICE FOR GARDEN SHREDDER

Robert D. Lautzenheiser, and Howard M. Ullman, Jr., both of Bluffton, Ind., assignors to The Red Cross Manufacturing Corporation, Bluffton, Ind.

Filed Feb. 3, 1972, Ser. No. 223,140
Int. Cl. B02c *13/16*
U.S. Cl. 241—186 R **2 Claims**



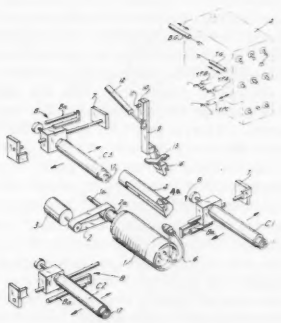
1. In a shredding and bagging machine for yard usage, the combination comprising a base of shallow cup shape having a bottom wall and a circular side wall defining a shredding chamber, transport means for supporting the base in horizontal position slightly upraised above the ground, a cover plate fitted to the base for enclosing the same, an engine mounted on the cover plate and having a drive shaft which extends into the base, a rotor mounted on the shaft including a blade having tip portions extending to the region of the side wall, a plurality of stationary breaker members at spaced positions on the side wall and having horizontal notches formed therein for registering with the tip portions of the blade, means including a discharge conduit penetrating the side wall for forcible discharge of the shredded material, the cover plate having a receptacle for feeding material into the chamber, a ramp of flaring construction having side walls defining a narrow upper end and a wide lower end, and means for securing the ramp with respect to the receptacle so that the narrow end communicates with the receptacle and so that the wide end extends downwardly at a shallow angle into engagement with the ground thereby permitting leaves or the like lying on the ground to be swept upwardly into the receptacle.

3,870,240

YARN CUTTER FOR USE IN YARN WINDERS

Harry B. Miller, Hopedale, Mass., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

Filed May 25, 1973, Ser. No. 364,074
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 A **8 Claims**



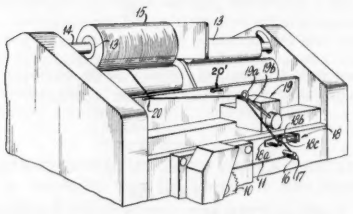
1. A yarn pick-up and severing device, particularly for mounting on a rotating winder chuck, comprising a support adapted to be mounted for rotation about an axis and having a surface extending transversely of said axis; engaging means mounted on said surface and operative for clampingly engaging a proximal yarn, with reference to which said support rotates, in such a manner that the yarn becomes convoluted about said engaging means during such rotation, said engaging means comprising an engaging member mounted on said surface and defining a slight gap therewith, a clamping arrangement extending from said surface across said gap into biased contact with said engaging member so as to clampingly engage and retian a yarn which enters into said gap; and severing means on said engaging means and operative for severing said yarn only upon at least partial completion of a yarn convolution about said engaging means.

3,870,241

APPARATUS AND METHOD FOR TREATING YARN

David W. Norwood, Baltimore, Md., assignor to Concorde Fibers Inc., Columbia, Md.

Continuation of Ser. No. 172,704, Aug. 18, 1971, abandoned.
This application July 23, 1973, Ser. No. 382,103
Int. Cl. B65h 54/02
U.S. Cl. 242—18 A 5 Claims



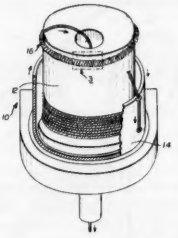
1. In an apparatus for winding yarn comprising means for holding a yarn package support onto which support the yarn is to be wound, a rotationally driven roller for engaging the surface of the yarn package support upon threading-up and thereafter the surface of the package of yarn being formed on the support thereby to define a nip with and rotationally to drive the yarn package support and the yarn package being formed thereon, a traverse guide for guiding the yarn to said nip whereupon the yarn is wound onto the package support, means for reciprocating the traverse guide relative to the rotating package support thereby to distribute windings of the yarn on the package support, means for holding a second yarn package support in juxtaposition to the first yarn package support, a second rotationally driven roller for engaging the surface of the second yarn package support upon threading-up and thereafter the surface of the package of yarn being formed on the support thereby to define a nip with and rotationally to drive the second yarn package support and the yarn package being formed thereon, a second traverse guide for guiding the yarn to said nip of the rotating second roller and rotating second package support, means for guiding the yarn to the second nip whereupon the yarn is wound on the second package support, means for reciprocating the second traverse guide relative to the second package support thereby to distribute windings of the yarn on the second package support, a change-over guide, means for moving said change-over guide from a first position for guiding the yarn to the first traverse guide to a second position for guiding the yarn to the second traverse guide, and means for guiding the yarn to the change-over guide, the improvement in which the means for guiding the yarn to the change-over guide and the two traverse guides each comprise means defining at least two surfaces for passage of the yarn in contact therewith in a zig-zag path, said means for guiding the yarn to the change-over guide and the two traverse guides each thereby being adapted to maintain the arrangement of a yarn fed thereto which yarn is constituted of a plurality of ends arranged in mutually parallel side by side relation.

3,870,242

YARN RETARDING DEVICE

Edward W. Schussel, King of Prussia, Pa., assignor to Wesco Industries, Corporation, Plainview, N.Y.

Filed Apr. 22, 1974, Ser. No. 463,099
Int. Cl. B65h 51/20
U.S. Cl. 242—47.01 4 Claims



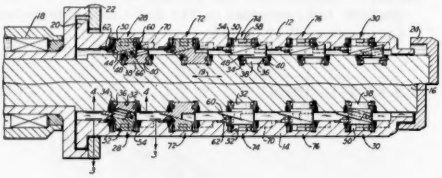
1. In a yarn storage device having a storage drum adapted to have yarn wound tangentially thereon and unwound axially therefrom, a retarding device surrounding said drum and adapted to have said yarn passed thereunder as it is axially withdrawn, said retarding device comprising a coiled spring whose opposite ends are secured to each other to form a continuous retarding ring having an inner contour smaller than the outer contour of said drum before said ring is mounted on said drum, whereby said ring is placed under tension when mounted on said drum, each coil of said spring having a curved portion in bearing engagement against said drum which defines a constant resistance to the yarn which passes thereunder as it is axially withdrawn from the drum.

3,870,243

COLLAPSIBLE REEL

Albert Theodore Briggs, Tarentum, Pa., assignor to Wean United Inc., Pittsburgh, Pa.

Filed Sept. 13, 1973, Ser. No. 397,196
Int. Cl. B65h 75/24
U.S. Cl. 242—72.1 7 Claims



6. An expandable reel having a central arbor,
radially movable segments arranged circumferentially around said arbor in a manner to form a continuous supporting surface for strip-like material,
a series of spaced-apart cylindrical bores formed in said arbor for each segment,

other series of cylindrical bores formed in each of said segments, one for each arbor bore and in radial alignment therewith to form associated pairs of bores,

first elements having cylindrical portions received in one of said bores of each pair, each having similar inclined surfaces disposed in the same direction,

second elements having cylindrical portions received in the other bores of each pair having means for engaging with and being displaced by said inclined surfaces,

said inclined surfaces being such that on relative axial movement of said segments and arbor said segments are caused to move radially relative to said arbor,

said first element and said second element each having locking means,

holding means arranged in said both series of bores, and

said locking means of first and second elements including means adapted to be held by said holding means when said elements are rotated in a certain position relative to said holding means.

3,870,244

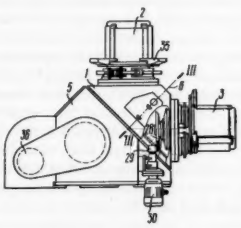
METAL STRIP COIL CHANGING DEVICE

Rafael Tevosovich Sarkisov, ulitsa Aga-Neimatula, 20a, kv. 28; Ernst Arakelovich Stepanian, ulitsa Druzhby Molodezhi, 2, kv. 36, and Valentin Grigorievich Bondarenko, Leningradsky prospekt, 115, kv. 11, all of Baku, U.S.S.R.

Filed May 29, 1973, Ser. No. 364,401

Int. Cl. B21c *47/00*

U.S. Cl. 242—80 **4 Claims**



1. A device for changing coils of metal strip having a weight of over 100 kg which strip is fed into an automatic press with a vertical plane of pressing, said device comprising: a platform with radial mandrels, one of which is horizontal and carries a standby coil, and the other is directed vertically upwards and carries the coil being unreeled; means for securing said coils on said mandrels; a carriage movable in the direction of said horizontal mandrel and mounting said standby coil so as to align its axis with the axis of said horizontal mandrel, means connecting said carriage with said means securing said coils on the mandrels such that with the carriage in one position the coils are secured on the mandrel whereas in a second position the coils are loose on the mandrel, said first and second positions being disposed axially along the mandrel, means for axially displacing said carriage between said positions, said means for axially displacing said carriage comprising a rotatable drive, and means threadably connecting said carriage to said drive such that upon rotation of said drive said carriage is correspondingly displaced axially between said positions, and means for turning said platform about the bisector of the angle formed by said radial mandrels, such that after each turn of the platform the previously vertical mandrel assumes the horizontal position coaxial with said standby coil, and the previously horizontal mandrel together with its standby coil secured thereon assumes the vertical position.

3,870,245

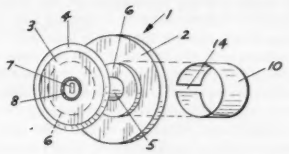
FISHING SPOOL

E. F. Witteborg, Jr., 3050 Duncan Rd., Shreveport, La. 71109

Filed July 5, 1973, Ser. No. 376,415

Int. Cl. B65h *55/00, 75/14*

U.S. Cl. 242—167 **4 Claims**



1. A spool for fishing reels comprising:

a. A shaft;

b. Base means, having an inside face and an outside face, said base means being attached to one end of said shaft;

c. An insert mount attached to said inside face of said base means;

d. A line guide means having an inside face and an insert mount attached to said inside face in essentially parallel relationship to said insert mount attached to said base means; and

e. An insert having a smooth inside and outside surface and a gap therein across the entire width thereof adapted to removably and rotatably fit on said insert mounts and span the distance between said base means and said line guide means.

3,870,246

AUTOMATIC CARTRIDGE TAPE DRAW-OUT DEVICE

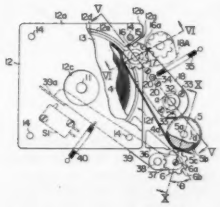
Hiroshi Yamada, Ichikawa, and Kenji Kojima, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Feb. 23, 1973, Ser. No. 335,416

Claims priority, application Japan, Mar. 10, 1972, 47-28216; Mar. 10, 1972, 47-29853

Int. Cl. G03b *1/04*; **G11b** *15/32*

U.S. Cl. 242—192 **11 Claims**



5. An automatic cartridge tape draw-out device for a tape wound on a circular supply reel rotatable in a cartridge and having at least one annular flange at the radial periphery thereof, comprising, in combination, a reel drive roller, means for rotating the reel drive roller in pressing engagement of the periphery thereof with the periphery of a flange of the reel to rotate the reel for causing the outer convolutions of the tape wound thereon to move radially outwardly by centrifugal force, a tape draw-out roller concentric with and in rigid connection with said reel drive roller and having a diameter greater than that of the reel drive roller, said tape draw-out roller including means defining a plurality of irregularities on its circumferential peripheral surface for engaging the leading forward end of the tape on said supply reel by means of said irregularities, said tape draw-out roller rotating at the same angular velocity as the reel drive roller and extending radially

inwardly of the periphery of the reel flange engaged by said reel drive roller to be in pressing engagement with the leading forward end of the tape on the supply reel when the outer tape convolutions thereof are caused to move radially outwardly by rotation of the reel to advance the tape from the cartridge with the forward end of the tape being maintained in engagement with at least some of the irregularities on the tape draw-out roller, and support means rotatably mounting said rollers and means for selectively moving the rollers into their respective engaging positions with the reel and with the tape wound on the reel, wherein the means defining the irregularities on the circumferential periphery of the tape draw-out roller comprise means defining a plurality of axially oriented grooves in the peripheral circumferential surface of the tape draw-out rollers, and means defining a plurality of axially extending projections interspersed with said grooves and separating said grooves.

3,870,247

CASSETTE-HANDLING SYSTEM

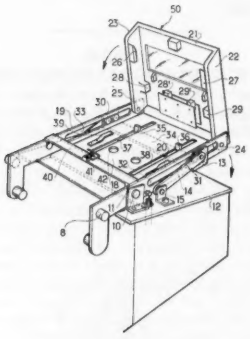
Camille Carisey, Creteil, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed July 28, 1972, Ser. No. 276,050

Claims priority, application France, July 30, 1971, 71.28141

Int. Cl. G11b *23/10, 15/66*

U.S. Cl. 242—198 **17 Claims**



1. A cassette-handling system comprising a cassette housing having guide and retaining means for guiding and holding a cassette, said housing having an opening in one end for receiving the cassette by movement of the cassette in its own plane, a casing containing a cassette drive system including a drive element projecting from said casing, a cradle pivoted to the casing and carrying said housing, said housing being pivoted to said cradle, and pivoting means for pivoting said housing and cradle from a loading position with the housing and cradle angularly disposed from the casing to a driving position against the casing so that said drive element of the cassette drive system engages the cassette for driving the medium contained therein, and then to an ejecting position, said cradle having an aperture therein, so that when the housing contains a cassette and is pivoted to lie against the cradle and the cradle is pivoted to lie against the casing, said drive element of the cassette drive system passes through said aperture in the cradle to engage the cassette and drive the medium contained therein.

3,870,248

TAPE PLAYER

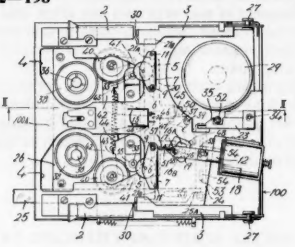
Hirotoshi Nara, Urawa; Wataru Watanabe, Hagi; Tadashi Yokota, Urawa, and Chiak Yanagi, Tokyo, Japan, assignors to Clairion Co., Ltd., Tokyo, Japan

Filed Sept. 27, 1972, Ser. No. 292,673

Claims priority, application Japan, Sept. 30, 1971, 46-88745[U]; Sept. 30, 1971, 46-89732[U]

Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*

U.S. Cl. 242—198 **6 Claims**



1. In a tape player of the type having a sound reproducing head and wherein a cassette containing a pair fo reels on which a sound tape is wound is removably loaded in a predetermined position in said player and said tape is passed between a first drive pair comprising pinch roller and a capstan and then between a second drive comprising a pinch roller and a capstan, and said first and second tape drive pairs are selectively operated to reverse the direction of running of said tape with respect to said sound reproducing head, thereby enabling continuous reproduction of a plurality of channels recorded on said tape, the improvement which comprises the combination of switching means for selectively operating either one of said first and second pairs; control means for constantly urging said switching means in a given direction thereby permitting loading of said cassette while said tape is driven in a given direction; and a movable plate which is moved in a vertical direction with respect to the reel hubs of said cassette loaded in said player, said control means being actuated in response said switching means when said player is prepared for loading and unloading of said cassette.

3,870,249

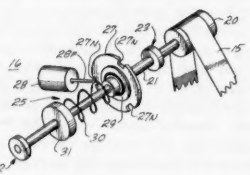
CONTROLLED FRICTION TAPE ROLLER

William A. Schrader, Mission Viejo, and Joe Schmidt, Fullerton, both of Calif., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed Oct. 24, 1973, Ser. No. 409,081

Int. Cl. B11b *15/32;* **G03b** *1/04;* **B65h** *23/06*

U.S. Cl. 242—201 **7 Claims**



1. In a tape transport system including at least a single rotatable tape storage reel having tape extending therefrom to be wound from a tape source and unwound therefrom,

means for driving the storage reel to transfer tape thereto from the tape source, tensioning means coupled to the tape adjacent the storage reel for increasing the tension of the tape extending between the storage reel and said

tensioning means whereby the tape wound on the reel is tightly wound thereon,

said tensioning means comprising a rotatable drum and braking means arranged coaxially therewith for providing a preselected amount of drag for the drum and being arranged to be normally operative, and means for selectively rendering the braking means inoperative.

3,870,250

PROCESS AND PLANT FOR PNEUMATIC TRANSPORT

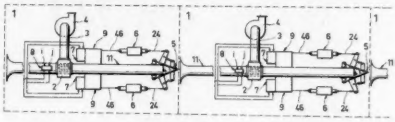
Constantin Gh. Teodorescu, and Stefan P. Ardeleanu, both of Bucharest, Romania, assignors to Institutul Pentru Creatie Stintifica Si Technica-Increst, Bucharest, Romania

Filed Mar. 28, 1973, Ser. No. 345,722

Claims priority, application Romania, Mar. 31, 1972, 70354

Int. Cl. B65g *51/04*

U.S. Cl. 243—6 **8 Claims**



1. A system for transporting an object comprising:

a plurality of in-line tube sections, each including:

an elongated tube having an upstream end and a downstream end,

a plurality of rollers mounted at a lower portion and/or opposite lateral portions of each tube along the interior thereof and uniformly spaced along the entire length of the tube,

two flaps extending from the exterior toward one another to normally close said downstream of said tube by sealing engagement with one another, said tube being open at its upstream end;

an elongated object adapted to traverse said tubes riding on said rollers;

a device proximal to but spaced from the downstream end of each of said tubes for creating a low-pressure zone between said downstream end and said object for drawing said object from each upstream end toward the respective downstream end of each tube;

means adjacent said device for detecting the proximity of said object for applying to each pair of flaps an opening force insufficient to swing said flaps apart and open said downstream end in the absence of an additional force, but sufficient upon the generation of an over-pressure ahead of said object to open said flaps and permit the object to pass into the upstream end of the next following tube, said rollers being each sealingly mounted in housings external to said tubes with each roller penetrating through a hole formed along the wall of the tube, each tube comprises a pair of triangular walls which define with the respective flaps a normally closed gate, said walls being mounted on the downstream end of the respective tube, and means for pivoting each pair of flaps on the respective downstream end of a tube.

3,870,251

AUTOGYRO

Gerald L. Breuner, 50 Milady Ln., Orinda, Calif. 94563

Continuation-in-part of Ser. No. 329,076, Feb. 2, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 452,712

Int. Cl. B64c *27/02*

U.S. Cl. 244—17.21 **3 Claims**

1. An autogyro comprising a cabin,

a tubular duct supported on the cabin rearwardly thereof and in spaced relation thereto,

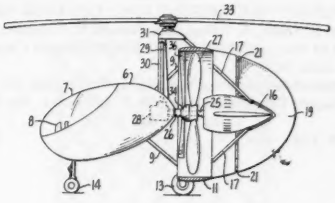
an engine supported within the duct in substantial axial alignment therewith and spaced from the cabin,

a propeller located between the engine and the cabin,

a rotatable first shaft extending forwardly from the engine and driven by the engine,

gear means connected to the first shaft forwardly of the propeller,

a tubular shaft concentric with the first shaft and rotatable by the gear means,



the propeller fixed on the tubular shaft for rotation therewith within the duct and between the engine and cabin,

upright rotor support pylon means supported on the cabin,

upright rotor drive shaft means supported by the pylon means and connected to the gear means to be rotated thereby,

and rotor blade means fixed on the rotor drive shaft means for rotation therewith.

3,870,252

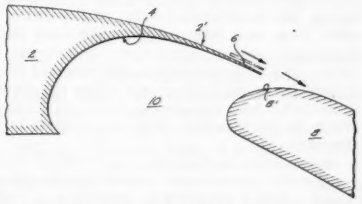
VARIABLE CAMBER AIRFOIL TRAILING EDGE

James Byron Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 9, 1973, Ser. No. 339,640

Int. Cl. B64c *9/08*

U.S. Cl. 244—42 CC **5 Claims**



1. An aircraft having a wing which has two or more airfoil segments chordwise thereof, the relatively forward of which segments has a resiliently bendable lip cantilevered from the main body thereof along the upper margin thereof, and the relatively aft of which segments is mounted to extend and retract in relation to the relatively forward segment, between (1) a relatively extended position wherein the relatively aft segment is spaced apart from the relatively forward segment, to form an aerodynamic slot therebetween, and (2) a relatively retracted position wherein the aft segment nests with the relatively forward segment to close the slot therebetween, said lip having a terminal edge portion and being cantilevered from the main body of the relatively forward segment so that (1) the relatively aft segment engages the lip in the relatively retracted position thereof and deflects the lip upward in relation to the main body of the relatively forward segment, to cause the lip to assume a relatively bent condition in which the upper side of the lip is faired into the contour of the upper side of the wing, and (2) the relatively aft segment disengages from the lip in the relatively extended position thereof and enables the lip to relax in relation to the main body of the relatively

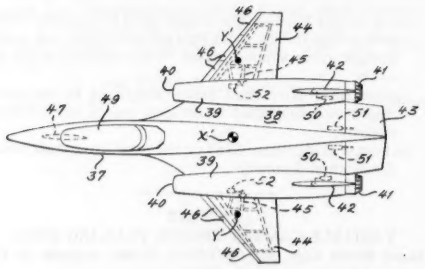
forward segment, to assume a relatively unbent condition in which the edge portion of the lip is spaced apart from the relatively aft segment to define the upper end of the slot therewith, and pointed across said upper end of the slot so that the contour of the upper side of the forward segment follows a smooth line of projection coinciding with the upper side of the lip and intersecting the body of the aft segment.

3,870,253

AIRCRAFT VECTORED FLIGHT CONTROL MEANS

William S. Leidy, O'Fallon, and Donald M. Scheller, Ballwin, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 164,621, July 21, 1971, abandoned. This application July 2, 1973, Ser. No. 375,633
Int. Cl. B64c *3/38*
U.S. Cl. 244—46 **5 Claims**



1. In an aircraft, the combination of:

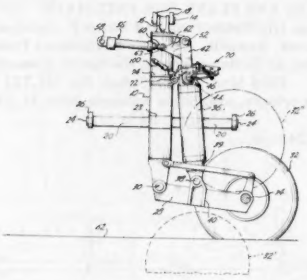
1. an elongated fuselage providing a primary lifting surface having the aerodynamic center and center of gravity offset from each other on the longitudinal axis of the fuselage;
2. all movable wing surfaces pivotally mounted on the outboard sides of said fuselage and having the aerodynamic center offset from said aerodynamic center and center of gravity in the direction of the longitudinal axis of the aircraft,
   a. said primary surface and wing surfaces having the respective aerodynamic centers thereof acting to impose pitching moments in opposition to each other about the center of gravity;
3. longitudinal elevator control surface means operable on said fuselage aft of the center of gravity,
   a. said elevator control surface means providing longitudinal flight control forces to trim and control pitching moments on the aircraft imposed by said primary surface and wing surfaces;
4. and control means connected to said wing surfaces and elevator control surface means for selective operation for
   a. controlling the pointing of the longitudinal axis of the aircraft about the center of gravity independently of a predetermined longitudinal flight path and load factor by deflection of said elevator control surface and counter deflection of said wing surfaces,
   b. and controlling a change in the altitude of the aircraft while flying a predetermined flight path by vertical translation of the aircraft to a different elevation generally parallel to said predetermined flight path by concurrent deflection of said wing and elevator surfaces to positive and negative angles of incidence in a selective mode.

3,870,254

LANDING GEAR AND LOCKING APPARATUS THEREFOR

John Watts, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1973, Ser. No. 345,673
Int. Cl. B64c *25/26*
U.S. Cl. 244—102 SL **2 Claims**



1. A retractable landing gear apparatus comprising in combination:

a main support strut,

a trailing arm and first means pivotally connecting said trailing arm to the lower portion of said main strut,

a wheel and means mounting said wheel for rotation on the aft portion of said trailing arm,

an articulated retraction strut including shock absorber means, second means mounting one end of said retraction strut to said trailing arm for pivotal movement about a first axis and third means mounting the other end of said retraction strut to said main strut for pivotal movement about a second axis parallel to said first axis, said retraction strut including means for articulating said retraction strut about a third axis parallel to said first and second axes and located between said first and second axes, said third axis lying substantially in a first plane defined by said first and second axes when said trailing arm is in an extended position, said third axis being spaced from said first plane when said trailing arm is pivoted upwardly to a retracted position to thereby decrease the distance between said first and second axes,

a first link and means connecting said first link to said main strut for pivotal movement about a fourth axis parallel to said first axis,

a second link and means connecting said second link to said retraction strut for pivotal movement about a fifth axis parallel to said first axis, and means connecting said first and second links for pivotal movement about a sixth axis parallel to said third axis,

said links and connecting means cooperating such that, when said trailing arm is in said extended position, said links fold toward each other so that said sixth axis is on one side of a second plane defined by said fourth and fifth axes when said link means are folded, said first and second links including first stop means cooperating to prevent further movement of said sixth axis away from said second plane,

said links and connecting means cooperating such that, when said trailing arm is in a retracted position and said third axis of said articulated strut is moved away from said first plane, said links unfold to a position wherein said sixth axis is located on the other side of said second plane defined by said fourth and fifth axes, said first and second links including second stop means cooperating to prevent further movment of said sixth axis away from the other side of said second plane, and

force-producing means operatively connected to at least one of said link means for biasing said sixth axis away from said second plane when said trailing arm is in said extended position and when said trailing arm is in said retracted position, and

power means operatively connected to said articulated retraction strut for moving said articulating means to extend and retract said trailing arm.

3,870,255

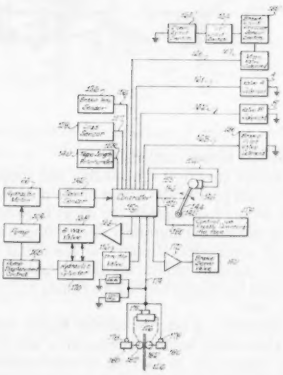
HOIST DRIVE SYSTEM

Harold Edminston Lemont, Calabasas, Calif., assignor to Hughes Tool Co., Culver City, Calif.

Continuation of Ser. No. 53,479, July 7, 1970, abandoned. This application Mar. 20, 1973, Ser. No. 343,128

Int. Cl. B64c *1/22*

U.S. Cl. 244—137 **5 Claims**



1. In a hoist system for lifting and lowering loads from a hovering type aircraft, the combination of:

an elongated flexible tension member to support loads;

rotary means on the aircraft in engagement with the tension member for extension and retraction thereof;

fluid motor means connected to said rotary means for actuation thereof;

fluid pump means;

means connecting the pump means to the motor means for flow of fluid thereto,

said connecting means including reversible means operable in one respect for flow of fluid in one direction through the fluid motor means to cause the tension member to travel in one direction and operable in the opposite respect for flow of fluid in the opposite direction to cause the tension member to travel in the opposite direction;

means for remote operation of said reversible means in its opposite respects selectively to control the direction of travel of the tension member;

means to vary the displacement of one of said pump means and said fluid motor means to control the rate of travel of the flexible member;

said motor means being constructed to act as temporary pump means on said fluid with the temporary pump means actuated by the weight of a descending load on the tension member;

means to restrict the fluid discharge of the temporary pump means to retard the lowering of the load and said restricting means is normally ineffective;

brake means to retard the lowering of the load; and

means to make the restricting means effective in response to rise in temperature of the brake means.

3,870,256

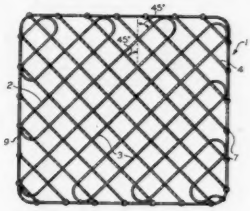
HEAVY-DUTY WIRE-NET STRUCTURE

John A. Mazzella, and Joseph S. Mazzella, both of 2315 Eastchester Rd., Bronx, N.Y. 10461

Filed May 24, 1973, Ser. No. 363,720

Int. Cl. B66c *1/12*

U.S. Cl. 245—8 **4 Claims**



1. A wire-net structure comprising:

a generally rectangular frame;

a multiplicity of first wire elements anchored at their ends to said frame, said first wire elements extending substantially parallel to one diagonal of the rectangle defined by said frame; and

a continuous cable of meandering configuration with sections substantially parallel to the other diagonal of said rectangle, said sections constituting second wire elements intermeshed with said first wire elements, said continuous cable being secured to said frame only through said first wire elements.

3,870,257

ELECTROSTATIC RECORDING USING DISCHARGE SPACE POTENTIAL

Toshio Ohkubo, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,743

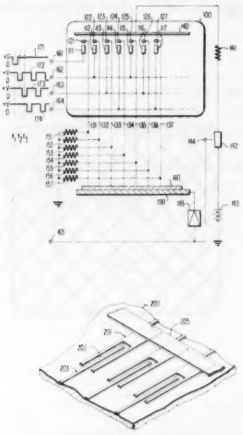
Claims priority, application Japan, Aug. 22, 1972, 47-84281

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 ES **5 Claims**

1. In an electrostatic recording device for facsimile and the like comprising: an envelope adapted to hermetically contain at least one kind of gas for developing a gas discharge; a first plurality of electrodes arranged to cause gas discharges one after another and thereby to provide a spatial scanning by the discharges; a second plurality of electrodes disposed adjacent respective ones of said scanning electrodes for picking up voltages induced at the conductive state of said gas discharges; at least one common electrode provided opposite to said first plurality of electrodes, said gas discharges occurring between said common electrode and said first plurality of electrodes; a plurality of stylus electrodes each connected at one of their ends to respective ones of said second plurality of electrodes with the other end thereof arranged in a straight line with the corresponding ends of the remaining stylus electrodes on the outside of said envelope and positioned to come in contact with one surface of a recording medium; variable resistance means connected to said common electrode for controlling the currents of said discharges in response to the level of a video signal to be recorded; and means for applying said video signal to the other surface of said recording medium, the improvement wherein said first plurality of electrodes each

have a notch formed in one end thereof remote from said common electrode and said second plurality of electrodes are



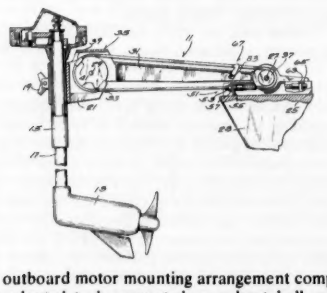
disposed in a one-to-one correspondence in the notches formed in said first plurality of electrodes.

3,870,258

PULLEY MOUNTING SYSTEM FOR ELECTRIC OUTBOARDS

William J. Shimanckas, Waukegan, and W. Wayne Beem, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed July 23, 1973, Ser. No. 381,602
Int. Cl. F16m *1/02*
U.S. Cl. 248—4 **9 Claims**



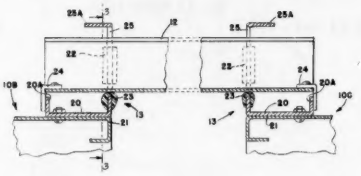
1. An outboard motor mounting arrangement comprising a member adapted to be mounted on a boat hull, a bracket adapted to support an outboard motor, an arm pivotally connected to said bracket and pivotally connected to said member for pivotal movement relative to said member between a storage position in which said arm extends in one direction from said member and an operating position in which said arm extends in the direction generally opposite to said one direction, an arcuate surface on said bracket co-axial with the pivotal connection of said bracket to said arm, and means including an element operably connected to said member and to said bracket and extending tangentially to said arcuate surface for rotating said bracket relative to said arm through an angle of about 90° in response to movement of said arm through an angle of about 180° between said storage position and said operating position.

3,870,259

FISHING ROD HOLDER

Lester A. Reynolds, 95-184 Mohai Pl., Mililani Town, Hawaii 96889

Filed Aug. 8, 1973, Ser. No. 386,646
Int. Cl. A01k *97/10*
U.S. Cl. 248—43 **6 Claims**



1. A fishing rod holder comprising:

a tubular holder structure surrounding and supporting the entire wooden handle and a part of the metal upper portion of a fishing rod, wherein the upper edge of the tubular holder structure is uniformly steeply sloped at an angle to provide mechanical support for the metal portion of the rod by partially embracing the metal portion of the rod opposite the region on which a fishing reel is normally attached, and

a means attached to a side the tubular holder structure for affixing the tubular holder structure to a boat from which fishing is conducted, so that the tubular holder structure and fishing rod are maintained in a generally vertical orientation.

3,870,260

SHIFTABLE CABLE SUPPORT

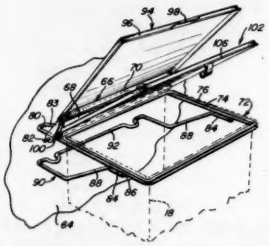
Gary M. Swart, Lincroft, N.J., assignor to Estey Corporation, Red Bank, N.J.

Filed Oct. 19, 1973, Ser. No. 399,707
Int. Cl. F16l *3/02*
U.S. Cl. 248—49 **8 Claims**

1. A cable support for positioning electrical conductors connected to articles which are movable with respect to each other comprising: a channel for housing the conductors; said channel including closed sides and a closed bottom and an open top for the insertion of said conductors; mounting means for the channel on each of the articles for slidably supporting the channel when either one of the articles is moved; said mounting means including bracket means secured to the articles and having an opening which is aligned with the open top of said channel permitting the insertion of conductors and a plurality of plastic bearing covers held by the bracket means

and arranged for sliding contact with the channel sides and bottom.

3,870,261
FLEXIBLE BAG HOLDER
Thad M. McSwain, 1908 S. Columbus St., Stuttgart, Ark. 72160
Filed Jan. 22, 1973, Ser. No. 325,527
Int. Cl. B65b *67/12*
U.S. Cl. 248—101 **1 Claim**

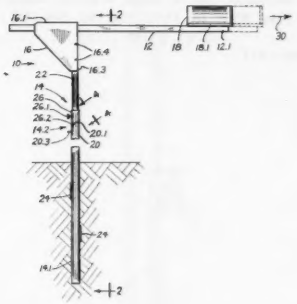


1. As an article of manufacture, a support and holder for a flexible bag, a U-shaped adapter bracket having a bight portion removably fastened to a vertically oriented support, a pair of spaced parallel arms extending horizontally from said bight portion, a rigid bag suspending frame attached to said arms, said frame around its periphery having upwardly facing convexly rounded bag seating surfaces receiving the lip portion of the open mouth of a bag, said bight portion being spaced from said frame and having bent portions which extend from said bight portion toward said frame, the space between the bent portions and the adjacent parts of the frame providing space for the storage of bags, a horizontal hinging rod spanning said storage space and having end portions supported by the spaced parallel arms, a clamping frame having attaching ears pivotally mounted on said hinging rod, coextensive in dimensions with said suspending frame, and being channel-shaped in cross-section and coacting with the bag seating surfaces of said suspending frame to clamp the lip portion of a bag therebetween, a lid generally coextensive in dimensions with both said frames, having apertured ears which also pivotally support said lid from said hinging rod, having a latching means on the periphery thereof opposite said bight portion engaging the suspending frame, and covering the open mouth of a bag and the two frames when in closed position, said bight portion of said bracket includes hinge means allowing said bracket to assume either a horizontally disposed in-use position or a downwardly disposed collapsed position and wherein said bracket includes a sleeve member secured to a central portion of each of said parallel arms, and being substantially parallel thereto, for receiving the end of bracing means, extending from the sleeves to a vertical support, which braces the bracket, frames and lid in an in-use position, but when removed, allows the bracket, frames and lid to pivot about the bight portion of the bracket to a collapsed position.

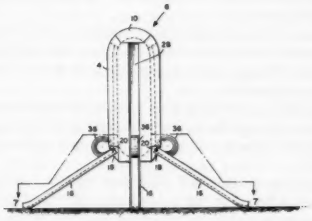
3,870,262
SWINGABLE, DEMOUNTABLE MAILBOX SUPPORT
James D. Manning, Jr., 514 Old Hwy. 8, New Brighton, Minn. 55112
Filed Oct. 25, 1973, Ser. No. 409,658
Int. Cl. A47g *29/12*
U.S. Cl. 248—145 **9 Claims**

1. A swingable, demountable mailbox support for roadside use comprising a substantially horizontal bar having a mailbox at one end, an upright mounting post having at its upper end a bracket extending over the horizontal bar, the upper end of the post defining an upwardly oriented bearing and the bracket providing a downwardly oriented bearing, said bearings being horizontally and vertically spaced and slidingly receiving therebetween and horizontally supporting the horizontal bar, the bar being free of obstructions preventing it from sliding outwardly from between and completely disengaging the bearings, the upwardly oriented bearing being nearest the end of the bar bearing the mailbox and the bearings being fixedly oriented with respect to each other, and means permitting the bearings to swing about a vertical axis while retaining their fixed mutual orientation,

whereby the horizontal bar is caused to swing about the vertical axis in contact with the bearings when the mailbox is struck by a vehicle, the bar sliding outwardly from between the bearings and becoming freed from the post.



3,870,263
SELF-ERECTING POD
Russell J. Hardiman, Sellersville; Leigh David Leiter, Willow Grove, and Howard C. Valle, Doylestown, all of Pa., assignors to Ametek, Inc., New York, N.Y.
Filed Oct. 15, 1973, Ser. No. 406,271
Int. Cl. F16m *11/38*
U.S. Cl. 248—168 **3 Claims**



1. A self-erecting pod comprising:

an elongated body,

at least three substantially equally spaced legs pivoted to the body closely adjacent one end of the body and extending towards the other end of the body in their stowed position,

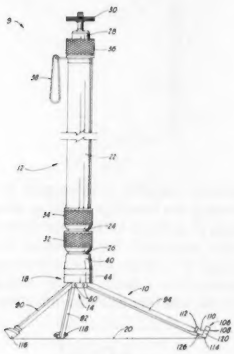
spring means to erect the pod with said one end nearer the ground from a substantially prone position by reacting against at least one arm supported by the ground to pivot the body relative to the ground supported arms and to pivot the remaining arms relative to the body to their supporting positions, said spring means comprising in each leg a tightly coiled ribbon spring having one end secured adjacent the pivot of the leg and the remainder of the spring extending in the uncoiled condition between the leg and the body, and

means to releasably retain said legs in the stowed position, said retaining means including means actuated on impact with the ground to release said retaining means to free the legs for pivoting and erection of the pod on the ground.

3,870,264
STAND

William I. Robinson, 201 N. Main, Wichita, Kans. 67202

Filed Mar. 26, 1973, Ser. No. 344,902
Int. Cl. F16m *11/38*
U.S. Cl. 248—171 **8 Claims**



1. A stand structure for mounting a camera or the like, comprising:

a. an upright positionable stand member having a hollow lower end portion, and means on the upper end portion thereof to mount a camera or the like,

b. hub means,

c. at least three leg members pivotally attached to said hub means in their inner end portions, said leg members extendable to a support position and retractable to a prestored position,

d. hollow mounting means, said mounting means receiving said leg members therethrough and having means to mount same in said lower end portion of said stand member,

e. gearing means with said hub means operatively connected between the inner end portions of said leg members to provide for pivoting said leg members simultaneously to said support position or said prestored position upon movement of any one of said leg members, and

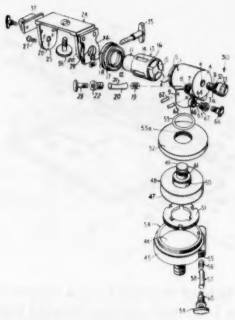
f. means with said leg members and said mounting means to removably secure said leg members with said mounting means in a retracted stored position, said means to removably secure said leg members having first latch portions on outer end portions of said leg members, and a second latch portion interiorly of said hollow mounting means, said first latch portions and said second latch portion being removably engagable to secure said leg members in said stored position, and said means to removably secure said leg members having means to maintain said first latch portions and said second latch portion in temporary engagement, and

g. one of said leg members being warped relative the other said leg members so as to press against said other leg members and urge said first latch portions and said second latch portion into engagement.

3,870,265
BASE MOUNTING FOR INSTRUMENTS AND MACHINES TO BE TILTED

George H. Osborne, Artarmon, New South Wales, Australia, assignor to R. E. Miller Pty. Limited, Artarman, New South Wales, Australia

Filed Aug. 17, 1973, Ser. No. 389,129
Int. Cl. F16m *11/12*
U.S. Cl. 248—183 **6 Claims**



1. A mounting for an instrument or machine which has to be tilted in the operation of aligning the instrument or machine with an object, said mounting comprising a housing, a cylindrical bore in the housing, a cylindrical piston in the housing bore, the piston periphery having working clearance from the bore periphery, a cylindrical extension of the piston concentric with the piston body and projecting beyond the housing, retaining means having a hole therethrough fixed to the housing with the cylindrical piston body extension passing through the retaining means hole, said retaining means restraining the piston against axial movement but permitting rotary movement thereof, sealing means held in position by the retaining means and sealing the housing to render it liquid tight, means on the housing whereby the housing is mountable on a mounting system; machine support, a first leg on said machine support fixed to the piston extension, a second leg on the support, a stub axle on the housing axially aligned with the piston, a hole in the second leg of the support engaging the stub axle and clamp means to lock the second leg of the support to the stub axle so as to prevent rotary movement of the piston in the housing.

3,870,266
SELF-LOCKING SHELF SUPPORT

Paul M. MacDonald, North Abington, Mass., assignor to P.X. Industries, Inc., Rockland, Mass.

Filed June 7, 1973, Ser. No. 367,745
Int. Cl. A47b *96/06*
U.S. Cl. 248—235 **3 Claims**

1. A self-locking shelf support, comprising

a. a plate formed with a lip extending perpendicularly from the front face thereof,

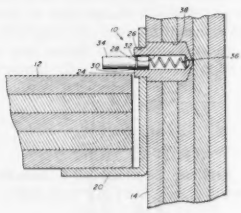
b. a plug fixed to said plate in spaced parallel relation to said lip and above said lip and extending perpendicularly from the rear face of said plate for mounting said support to a cooperating socket in an upright cabinet wall and the like.

c. said plug being formed with a chamber open at the front face of said plate and closed at the rear of said plug

d. a pin retractably mounted for limited axial movement in said chamber parallel to said plug, and,

e. resilient means engaging said pin and normally urging said pin to a position extending perpendicularly from the

front face of said plate in spaced parallel relation to said lip, said pin adapted to be temporarily retracted into said



chamber by axial pressure applied to the outer end thereof.

3,870,267

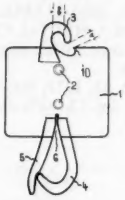
COMBINED PRODUCT HANGER AND LABEL SUPPORT

Kurt Okle, Tubach, Switzerland, assignor to Stoba AG, Horn, Switzerland

Filed Sept. 24, 1973, Ser. No. 400,568

Int. Cl. A47g *29/00*

U.S. Cl. 248—339 **2 Claims**



1. A combined hanger and label support comprising:

a label support member formed by an essentially flat plate member having opposed edges;

expandable resilient arm members for engaging the product to be suspended, said members protruding from the plane of the label support member at the region of one of the opposed edges;

a suspension hook extending from the opposite edge of the label support member for engagement with a suspension element to thereby suspend the combined hanger and label support, said suspension hook having a free end;

a nose member protruding from the plane of the label support member adjacent the free end of said suspension hook, said nose member and the free end of said suspension hook delimiting an opening for receiving therebetween said suspension element, said opening being smaller in size than the suspension element so that the suspension element can only be forcefully inserted through said opening for engagement by the suspension hook to thereby prevent unintentional release of the combined hanger and label support from the suspension hook; and

projection means protruding generally perpendicularly from the plane of said label support member for facilitating stacking of a plurality of such combined hanger and label supports, the projection means of one of said label support members being engageable with the projection means of an overlying label support member when a plurality of combined hanger and label supports are placed in a stack-like array.

3,870,268

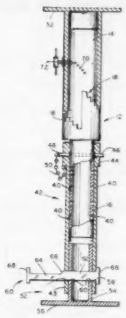
SHORING APPARATUS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,600

Int. Cl. E04g *25/00*

U.S. Cl. 248—354 P **4 Claims**



1. Shoring apparatus comprising a support post; a first telescoping sleeve slidably mounted on one end of said support post; first incremental step means cooperating with said support post and said first telescoping sleeve for selectively locking the relative positions therebetween in one of a first plurality of discrete steps; a second telescoping sleeve slidably mounted on the other end of said support post; second incremental stop means cooperating with said support post and said second telescoping sleeve for selectively locking the relative positions therebetween in a second plurality of discrete steps, each of the steps of said second plurality of steps being substantially greater than each of the steps of said first plurality of steps, whereby the overall length of the shoring apparatus can be adjusted finely by adjusting said first incremental stop means, and can be adjusted coarsely by adjusting said second incremental stop means; an elongate member mounted coaxially on said second telescoping sleeve for slidable movement relative to the latter, one of said elongate member and said second telescoping sleeve being slotted; and a release slide slidably passing through the slot in said elongate member and said second telescoping sleeve, said release slide being provided with thicker and thinner portions which can be selectively positioned within said slot, whereby insertion of the thicker portion in said slot causes the overall length of the shoring apparatus to increase, and insertion of the thinner portion into said slot causes the overall length of the shoring apparatus to decrease in length to thereby facilitate removal of the shoring apparatus while a load is still applied thereto.

3,870,269

SEAT, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Udo Werner; Kurt Biesen, both of Solingen, and Jurgen Sroka, Hilden, all of Germany, assignors to Firma Bremsky Aktiengesellschaft, Solingen-Ohligs, Germany

Filed July 2, 1973, Ser. No. 375,929

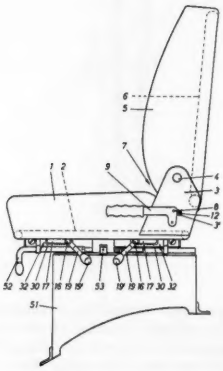
Claims priority, application Germany, June 30, 1972, 2232117

Int. Cl. A47c *3/22*

U.S. Cl. 248—394 **9 Claims**

1. A seat, particularly for automotive vehicles, comprising: a seat-cushion frame adjustable in height and inclination, two pairs of extension links;

a seat-base frame;
toggle lever links;
transverse-extending connecting rods; said seat cushion frames being connected via said two pairs of said extension links with said seat-base frame, said extension links being supported via said toggle lever links on said seat-base frame and being connected in pairs with each other by said transverse-extending connecting rods;
spring means, said connecting rods being urged by said spring means into a raised position of said seat-cushion frame and displaceably guided in slots in said seat-base frame;



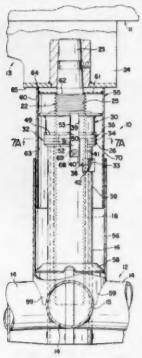
a releasable tooth-engagement lock, including teeth disposed within the range of said slots between each of said connecting rods and said seat-base frame such that said teeth being directed parallel to the plane of said slot, and wherein said connecting rods are tubular, a separate pin is disposed in each of said connecting rods and passing through said slot, being urged by spring means in the direction of rotation, and equipped with an operating lever, said pins are provided within the range of said slot with two diametrically opposite detent teeth, said teeth engage in an inclined position to said slot on oppositely disposed toothed slats extending parallel to edges of said slot.

3,870,270
FULLY ENCLOSED, ADJUSTABLE, SUPPORT COLUMN FOR A PIVOTAL CHAIR

Richard L. Holtz, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Oct. 31, 1973, Ser. No. 411,197
Int. Cl. F16m *11/24*
U.S. Cl. 248—406 **13 Claims**

1. An adjustable support column for pivotally mounting the seat section of a chair to a base portion comprising: a hub tube extending upwardly from the base, a threaded spindle non-rotatably secured to, and extending downwardly from, the seat section, at least a portion of said threaded spindle being rotatably and reciprocatingly received within said hub tube, an adjusting nut threaded onto said spindle to establish the extent to which said spindle can extend within said hub tube and thereby control the height of the seat section, a stop presented from said hub tube, a first arm means secured to said adjusting nut, and a lost motion device interposed between said arm and said first stop to permit relative rotation of said spindle with respect to said adjusting nut in order to effect adjustment in the height of said seat section only after the seat section has rotated within a range of free pivotal movement in either

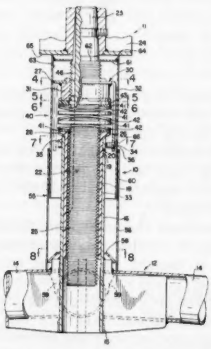


direction, the total range of such free pivotal movement being at least one full revolution.

3,870,271
FULLY ENCLOSED, ADJUSTABLE, SUPPORT COLUMN FOR A PIVOTAL CHAIR

Gary L. Bowman, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

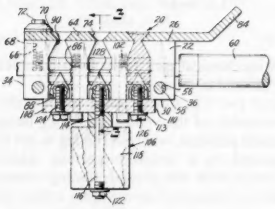
Filed Oct. 31, 1973, Ser. No. 411,196
Int. Cl. A47c *3/24*
U.S. Cl. 248—406 **12 Claims**



1. An adjustable support column for pivotally mounting the seat section of a chair to a base portion comprising; a hub tube extending upwardly from the base portion, a threaded spindle extending downwardly from the seat section, at least a portion of said spindle being rotatably and reciprocatingly received within said hub tube, an adjusting nut assembly threaded onto said spindle, a resilient means interposed axially between said adjusting nut assembly and said hub tube such that contact of the adjusting nut assembly with the hub tube through said resilient means establishes the extent to which said spindle can extend within said hub tube and thereby control the height of the seat section, stop means presented radially from said hub tube, contact means presented from said adjusting nut assem-

bly and extending axially past said resilient means to engage said stop means and permit relative rotation of said adjusting nut assembly with respect to said spindle in the absence of weight being supported on said spindle, said resilient means being compressed between said adjusting nut assembly and said hub tube in response to weight being supported on said spindle to displace said contact means with respect to said stop means and permit free rotation of the threaded spindle and adjusting nut assembly with respect to said hub tube.

3,870,272
BULLET MOLD
John A. Jackman, 8 Beaudoin St., Bedford, N.H. 03102
Filed June 11, 1973, Ser. No. 369,109
Int. Cl. B41b *11/62*
U.S. Cl. 249—170 **1 Claim**



1. A bullet mold for casting bullets from molten metal, the mold comprising:

first and second mold bodies, each of said bodies having inner faces with matching mold cavities formed therein, and each having upper and lower sides and opposite ends; an actuating jaw member for each mold body, the jaw members each having hinge sections and being hingedly connected to one another at said hinge sections;

the jaw members having ends remote from the hinge sections, and having handles on such ends;

the jaw members being connected between the hinge sections and the handles to the respective mold bodies;

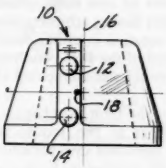
a sprue plate hingedly connected to the upper side of one of said mold bodies and being detachably engageable with the upper side of the other of said mold bodies, the sprue plate having openings therein aligned with said mold cavities when the body inner faces are in abutting relation and the sprue plate is in engaged condition;

laterally opposed engagement means carried by the lower sides of respective mold bodies;

a removable mold insert assembly for the formation of hollow sections in the castings made in said mold cavities, including an insert member for each of said cavities, and including a base member commonly supporting said insert members and engaged on respective sides by the engagement means of the lower sides of the mold bodies upon pivoting of said jaw members to closed position to capture said assembly with said inserts properly positioned within said cavity; and

the engagement means of the lower sides of the mold bodies comprising oppositely facing bracket members each having a lower projecting flange and wherein said base member is of stepped cross sectional configuration with lower recesses on opposed sides receiving respectively said projecting flanges.

3,870,273
SELF-INVERTING HOT TOP CASING
Joseph Perri, Corapolis, Pa., assignor to Aetna Business Credit, Inc., New York, N.Y.
Filed May 25, 1971, Ser. No. 146,701
Int. Cl. B22d *7/10*
U.S. Cl. 249—202 **3 Claims**



1. In a hot top casing having a central pouring opening therethrough and an external surface, the improvement comprising:

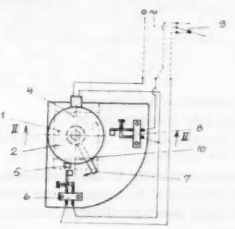
a. two independent pairs of lift trunnions extending from said external surface,

b. one of said pairs of trunnions being positioned above the center of gravity of said casing,

c. the other of said pair of trunnions being positioned below the center of gravity of said casing,

d. both of said pairs of trunnions being horizontally offset from the center of gravity of said casing to give said casing a designed weight imbalance so that said casing will rotate when elevated by the lower most pair of said two pairs of trunnions, whereby the casing is inverted automatically each time it is picked up by the lower most pair of said two pairs of lift trunnions.

3,870,274
MOTOR DRIVEN VALVE
Max Broe, Horsens, Denmark, assignor to Aktieselskabet Chr. Nielsens Eftf., Armaturfabrik, Horsens, Denmark
Filed June 29, 1973, Ser. No. 375,188
Claims priority, application Denmark, June 30, 1972, 3272/72
Int. Cl. F16k *31/04*
U.S. Cl. 251—134 **8 Claims**



1. In a motor operated valve of the type that includes a valve housing having a valve seat; a valve body mounted in the housing for movement between an open position and a shut position with respect to the valve seat; a motor mounted on the housing; means for coupling the motor to the valve member for moving the member between the open and the shut positions; first mechanical stop means positioned with respect to the housing for preventing movement of the valve body in one direction past the open position; second mechanical stop means positioned with respect to the housing for preventing movement of the valve body in the opposite direction past the shut position; a first single throw limit switch having one terminal connected to the motor and positioned with respect to the housing for disconnecting current to the motor when the valve body reaches the open position; a second single throw limit switch having one terminal connected to the motor

and positioned with respect to the housing for disconnecting current to the motor when the valve body reaches the shut position; and a double throw control switch having a movable contact connectable to a source of electric power, a first fixed contact connected to the other terminal of the first limit switch and a second fixed contact connected to the other terminal of the second limit switch, the improvement wherein: the motor consists of one single-phase, alternating current, synchronous motor having arbitrary directions of rotation that are reversible if rotation in either direction is blocked;

the one terminal of the first switch and the one terminal of the second switch are connected to the same motor lead; and

the first and second limit switches are positioned for disconnecting current to the motor before the valve body reaches the open and shut positions, respectively, so that the motor will stop before further movement of the valve body is blocked by the respective stop means.

3,870,275

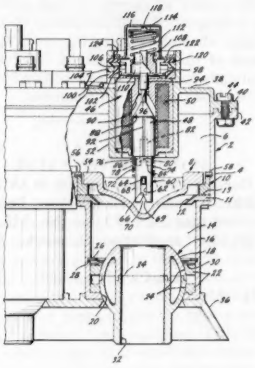
VALVE CONSTRUCTION

Allen Kallel, Santa Ana, Calif., assignor to Wemac Company, Santa Ana, Calif.

Filed May 24, 1973, Ser. No. 363,656

Int. Cl. F16k *31/10*

U.S. Cl. 251—252 **11 Claims**



1. A valve construction comprising:

an axially movable valve member;

a valve seat engageable by the valve member in a closed position;

follower means connected to said valve member;

ramp means positioned to support said valve member in a closed or open position through contact with said follower means;

said ramp means including a ramp surface having stepped portions positioned at different levels to contact said follower means in supporting said valve member at different levels with respect to said valve seat;

first means connected to said valve member through a last motion connections to move said valve member axially with respect to said valve seat; resiliently yieldable means positioned between said first means and said valve member to urge said first means and said valve member apart; second means to rotate said valve member through an incremental arc as said valve member is moved axially;

said incremental arc corresponding to the distance between said stepped portions of said ramp surface, and

said lost motion connection permitting relative movement between said first means and said valve member when said follower means is brought into contact with said stepped portions with the extent of relative movement being dependent on the level of the stepped portion which is contacted by said follower means.

3,870,276

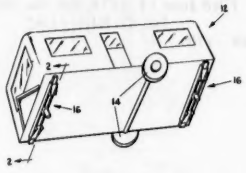
STABILIZING JACK

David P. Phillips, Lookout Mountain, Tenn., assignor to Wildwood Products, Inc., Lookout Mountain, Tenn.

Continuation-in-part of Ser. No. 281,459, Aug. 17, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,856

Int. Cl. B60s *9/02*

U.S. Cl. 254—86 R **5 Claims**



3. A mechanical jack for stabilizing a vehicle with respect to the ground comprising:

at least two legs spaced apart and movably mounted on the underside of the vehicle, each leg being movable from a raised position, wherein the leg is not in contact with the ground, to a lowered position, wherein the leg is in contact with the ground, the legs comprising upper ends that are mounted on movable rollers and lower ends that are pivotable about the upper ends into and out of contact with the ground;

means for guiding the upper ends of the rollers in a linear transverse path along the underside of the vehicle;

mechanical linkage means interconnecting the upper ends of the legs, said mechanical linkage means being adapted, upon receiving a mechanical driving force, to apply the mechanical driving force to the legs in the form of a horizontal transverse force applied to the upper ends of the legs, so as to cause the upper ends of the legs to move transversely on their rollers in their housings, said mechanical linkage means being further adapted to transmit said mechanical driving force to each leg equally and independently, regardless of the distance traveled by each leg;

arm means pivotably connecting a point on each leg spaced apart from the upper end thereof to a fixed position with respect to the underside of the housing, said arm means being adapted to cause each arm to pivot about its upper end between its raised and lowered positions as the upper end of the arm is moved along its transverse path on the underside of the vehicle;

drive means adapted to apply a mechanical driving force to said mechanical linkage means.

3,870,277

RAMP FOR VEHICLES

Roland J. West, Andover, Mass., assignor to Vaughn Corporation, Salisbury, Mass.

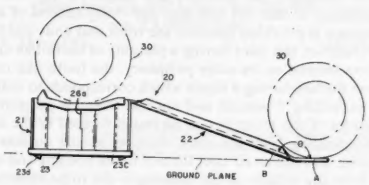
Filed Mar. 15, 1973, Ser. No. 341,765

Int. Cl. E02c *3/00*

U.S. Cl. 254—88 **9 Claims**

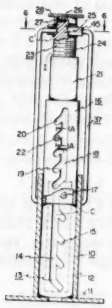
1. A portable vehicle ramp which includes a pedestal comprising a base member, at least two brace members having bottoms positionable on the base member and which interlock with and cross over each other, a top member supportable on the top of the brace members, means for holding the members together, an incline member positionable on said pedestal for coupling thereto to permit one wheel of a vehicle to move to

a position so that it is supported on the top member, and in which the brace members each have cutouts in the central



portion thereof so that the brace members cross over each other while the bottoms thereof lie in the same plane.

3,870,278
TELESCOPING STAND JACK
George W. Lee, Rangely, Colo., assignor to Arnold Bryce Booker and Shirl R. Kump, both of Rangely, Colo., a part interest to each
Filed Mar. 18, 1974, Ser. No. 452,197
Int. Cl. B66f *3/08*
U.S. Cl. 254—98 **10 Claims**



10. An improved telescoping jack stand including, in combination, plural telescoping members comprising a series and having respective means for mutually, releasably detent positioning said members, an upper screw-threaded member threadedly supported by and operatively engaging an upper one of said series, load supporting means upstanding from said screw-threaded member, and ratchet means for revolving said screw threaded member, said ratchet means comprising a U-shaped, resilient lever handle having inwardly directed ends, said screw-threaded member having plural radial bores selectively receiving said ends, and a ring member rotatably mounted about said screw-threaded member and over said radial bores and journaling said ends.

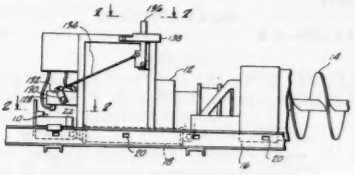
3,870,279
STEPPER CARRIAGE ADVANCEMENT SYSTEM
Bernard A. Century, Cleveland, Ohio, assignor to Allied Steel & Tractor Products, Incorporated, Cleveland, Ohio
Filed Sept. 11, 1972, Ser. No. 287,782
Int. Cl. B23g *5/26;* **B61d** *15/00;* **F16h** *21/44*
U.S. Cl. 254—105 **6 Claims**

1. An advancement mechanism for a horizontal earth boring machine supported on rails and comprising

a base capable of being moved along the rails in first and second directions,

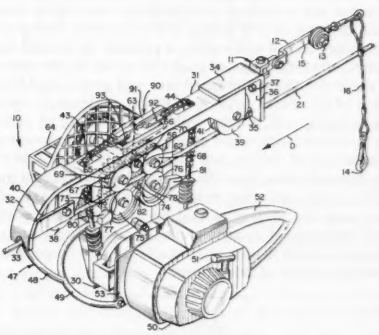
rigid members pivotally mounted to said base and extending to the rails, and

means on the rails for engaging said rigid members with the rails, said engaging means allowing pivotal movement of said rigid members into and out of engagement with the rails when said base is moved in said first direction and said engaging means allowing pivotal movement of said rigid members into and out of engagement with the rails when said base is moved in said second direction, and



stops movably mounted on said base capable of being positioned to selectively interfere with pivotal movement of said rigid members to constrain said members when in engagement with said means.

3,870,280
HIGH LINE TOWING DEVICE
Leslie E. Victor, 120 Lunden Dr., Ventura, Calif. 93003
Filed July 26, 1974, Ser. No. 492,341
Int. Cl. E21c *29/16*
U.S. Cl. 254—134.3 R **19 Claims**



1. A high line towing device capable of travelling along while being suspended from the messenger line, comprising:

a. a framework;

b. an overhead mounting bar secured to a top portion of the framework;

c. a support sheaves carried by forward and rearward portions of the overhead mounting bar and formed with guide grooves, the guide grooves being tandemly aligned to define an imaginary axis of travel along the messenger line;

d. a motor coupled to the framework and having a power output shaft, the motor being slung beneath the axis of travel and arranged to assist in load balancing;

e. upper drive means coupled to the framework and operatively engaged to the power output shaft of the motor;

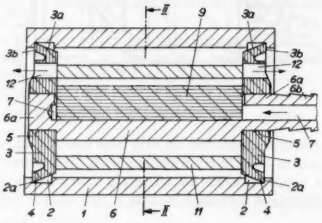
f. lower drive means coupled to the framework at a position beneath the upper drive means, the upper drive means and lower drive means being respectively located above and below the axis of travel; and,

g. a drive release mechanism coupled to the overhead mounting bar and being structured to mutually disengage and drivingly engage the upper and lower driving means.

3,870,281
COMPRESSED AIR VIBRATOR

Willy Fink, Zollikerberg, Switzerland, assignor to Findeva AG, Zollikerberg, Switzerland

Filed Nov. 2, 1972, Ser. No. 303,141
Claims priority, application Switzerland, Dec. 15, 1971, 18296/71
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R 3 Claims

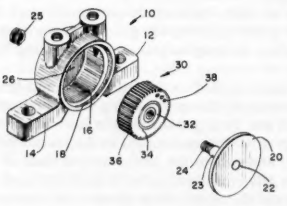


1. A compressed air vibrator comprising a cylindrical casing open at its opposite ends, a cover for each of the opposite ends of said casing for forming closures therefor, wherein the improvement comprises that said casing has a circumferentially extending groove in its inner surface adjacent each of its open ends, each said cover is formed of a plastic material and has a circumferentially extending edge which fits into the groove in said casing, the circumferentially extending edge of each said cover has a tapered configuration converging inwardly toward the axis of said casing in the direction facing toward the opposite end of said casing, a resilient lip formed around the circumferential edge of each said cover on the outer surface thereof with said lip fitted into said groove and having a portion of its surface bearing in sealed engagement against a corresponding wall surface within said groove, an eccentric mass positioned within said casing and movable therein under the influence of compressed air, said grooves of said casing being formed with at least the surface thereof adjacent the end of said casing extending perpendicularly to the axis of said casing, and the portion of said lip of said cover bearing in sealed engagement against a corresponding wall surface of said groove being in bearing contact with said perpendicularly extending surface of said groove.

3,870,282
NOISELESS AIR-ACTUATED TURBINE-TYPE VIBRATOR

Theodore S. Wadensten, P.O. Box 8 Stilson Rd., Allendale, N.J. 02898

Filed Apr. 30, 1973, Ser. No. 355,681
Int. Cl. B06b *1/16*
U.S. Cl. 259—1 25 Claims

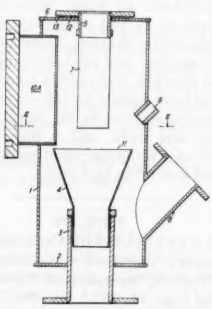


1. A relatively silent, compressed gas-actuated, turbine-type vibrator having a rotor of not less than 1¼ inches and not more than 5½ inches diameter and within a speed range of 6,000 to 10,000 rpms having a noise level not greater than 85 decibels hz., the vibrator including: (a) a substantially closed housing having a cylindrical chamber therein; (b) a dynamically unbalanced rotor freely rotatable in the cylindrical bore of the chamber, the diameter and length of the rotor being established so that not less than one thirty-second of an inch clearance is provided between the rotor and ends and bore of the chamber, the rotor having a plurality of tooth-like configurations formed on its outer periphery, the tooth-like configuration further having a depth which corresponds to a distance not exceeding 7 percent and not less than 1½ percent of the diameter of the rotor; (c) an air outlet formed in the housing and extending from the rotor chamber to the outside of the housing, and (d) an air inlet formed in the housing and extending from the outside of the housing to the rotor chamber, the air inlet arranged to direct the incoming pressurized air tangentially against the teeth of the mounted rotor and with the tooth like configurations so formed that in a plane normal to the axis of the rotor the face of the tooth like configuration against which the incoming air impinges defines an angle of intersection with the theoretical radial line of said rotor, said defined angle being as little as 0° and as great as 30° as measured from said point of intersection and inclined in such a direction that the circumferential thickness of the tooth like configurations tends to decrease as the radial distance from the axis increases and with the tooth-like configuration so formed that in a plane normal to the axis of the rotor the face of the tooth-like configuration against which the incoming air impinges defining an angle of intersection with a theoretical radial line of said rotor, said defined angle being as little as zero and as great as 30° as measured from said point of intersection and inclined in such a direction that the circumferential thickness of the tooth-like configurations tend to decrease as the radial distance from the axis increases, the cross-sectional area of the inlet being 30 to 55 percent of the area of the outlet diameter.

3,870,283
METHOD AND APPARATUS FOR MIXING A POWDER WITH A FLOWABLE SUBSTANCE

William Edward Hurst, Potters Bar, Hertfordshire, England, assignor to Mono Pumps (Engineering) Limited, London, England

Filed Dec. 7, 1972, Ser. No. 312,922
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 10 Claims

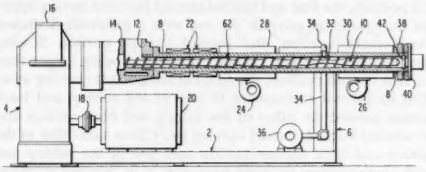


1. A method of mixing powder with a flowable substance including the steps of introducing substance into an enclosed mixing chamber, sucking the substance downwardly out of the chamber through a discharge passage thereby to generate a vortex in the flowable substance exiting from the chamber and simultaneously to create a partial vacuum in the chamber and introducing the powder into the vortex thus generated at a level above the discharge passage.

3,870,284
EXTRUDER SCREWS

George A. Kruder, Marion, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 23, 1972, Ser. No. 282,905
Int. Cl. B29b 1/06
U.S. Cl. 259—191 16 Claims

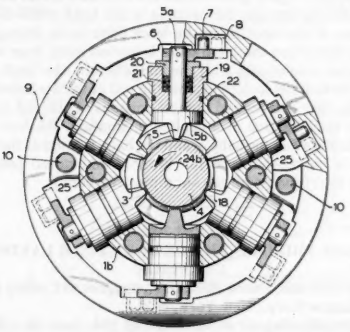


3. A multiple stage screw for extruders comprising at least two pumping sections spaced apart along the length of the screw and having a vent section therebetween, said vent section having a helical material flow channel therein, at least one of said pumping sections having a helical channel which varies in depth cyclically along its length through at least three cycles with the maximum channel depth portion of each cycle being of less depth than the depth of said channel in said vent section.

3,870,285
CONTINUOUSLY OPERATING KNEADING AND MIXING SCREW DEVICE FOR KNEADING AND MIXING KNEADABLE AND MIXABLE MATERIALS

Gunther Bausch, Vaihingen/Enz; Christian Millauer, Stuttgart, and Harald Paul, Kornwestheim, all of Germany, assignors to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Sept. 4, 1973, Ser. No. 393,838
Claims priority, application Germany, Sept. 1, 1972, 2243039
Int. Cl. B29b 1/06
U.S. Cl. 259—191 7 Claims



1. A continuously operating kneading and mixing screw device for kneading and mixing kneadable and mixable materials, said device comprising in combination:

a housing;

a power driven shaft rotatably mounted in said housing and mounting screw flights, said flights being interrupted to define spaces therebetween;

kneading and mixing elements extending from the inside of the housing into said spaces between the flights, said elements being disposed in circumferentially spaced relationship and arranged in groups, each of said groups being located in a plane normal to the center axis of said shaft;

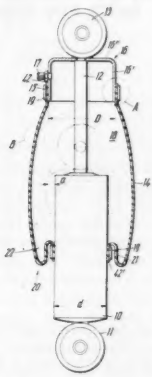
mounting means rotatably supporting said mixing elements; and

drive means coacting with said elements for turning the same independently of rotation of said shaft, said drive means being coupled to the elements in said groups for joined turning of the elements, said drive means being adjustable for controlling the angular positions of the elements in said groups.

3,870,286
FLUID SPRINGS, PARTICULARLY FOR VEHICLES

Jean Herbert Willich, Ennepetal, Germany, assignor to Firma August Bilstein, Ennepetal, Germany

Filed Oct. 17, 1973, Ser. No. 407,238
Claims priority, application Germany, Nov. 11, 1972, 2255304
Int. Cl. B60q 11/26
U.S. Cl. 267—64 R 9 Claims

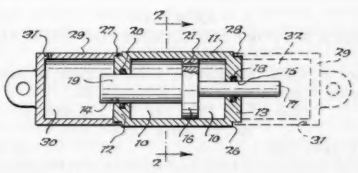


1. A fluid spring, particularly for vehicles, comprising two components arranged to be connected to two masses which are to be resiliently held apart, and an elastic, internally reinforced, rolling sleeve clamped at each end in gas-tight sealing relationship to the respective components, wherein the reinforced rolling sleeve is a portion of a continuously manufactured cylindrical tube of constant wall thickness cut to a desired length, and wherein the ends of the rolling sleeve are secured by annular clamping means.

3,870,287
GAS SPRING

John McMahon, 57 Leacliff Ln., West Seneca, N.Y. 14224

Filed Dec. 26, 1973, Ser. No. 428,089
Int. Cl. F16f 9/00
U.S. Cl. 267—113 9 Claims



1. An improved gas spring comprising:

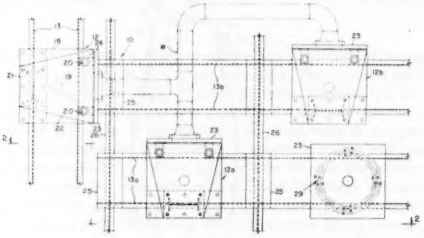
a. a gas loaded chamber defined by a rigid wall, and

b. opposite end walls each having a bore therethrough, but of different diameters,
c. a piston slideably mounted within said chamber,
d. a first piston rod rigidly fixed to the piston, extendible through the bore of one end wall,
e. a first seal mounted within the bore of said end wall and cooperating with the first piston rod to prevent escape of gas from the chamber,
f. a second piston rod, of different diameter than the first piston rod, rigidly fixed to the piston, extendible through the bore of the other end wall, and
g. a second seal mounted within the bore of said other end wall and cooperating with the second piston rod to prevent escape of gas from the chamber.

3,870,288
PIPE FABRICATION JIG

J. Stanley McLarnon, 460 Fairfield Ave., Greenfield Park, Quebec, Canada

Filed July 9, 1973, Ser. No. 377,296
Int. Cl. B23p *19/00*
U.S. Cl. 269—45 **7 Claims**



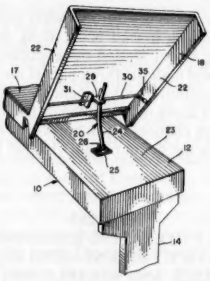
1. In a welded pipe fabrication jig for supporting large and heavy pipe sections; the combination comprising a pair of parallel rails extending in a horizontal direction;
a horizontally extending first track parallel to said parallel rails and spaced a horizontal direction therefrom;
a horizontally extending second track located perpendicular to said first track such that one end of said second track is horizontally spaced from said first track;
means for movably supporting said second track on said parallel rails;
at least one first locating plate assembly movable along said first track;
at least one second locating plate assembly movable along said second track and hence movable in a perpendicular direction to the direction of movement of said first assembly on said first track, each said assembly including a carriage movably mounted on the respective said track, a locating plate, means for mounting said locating plate on said carriage, means for adjusting said locating plate to a predetermined attitude relative to said mounting means, and pipe component supporting means on said locating plate.

3,870,289
BACK SUPPORT MECHANISM FOR MEDICAL EXAMINATION TABLE

Clarence J. Aulik, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed July 5, 1973, Ser. No. 376,456
Int. Cl. A61g *13/00*
U.S. Cl. 269—324 **15 Claims**

1. In an examination table having a base, a subtop supported by the base, and a top supported by the subtop, the top having a tiltable back section pivotable about a horizontal axis between a substantially horizontal lowered position in which the back section is spaced slightly from the subtop and a raised position, an improved support assembly for the back section of the top comprising an elongated curved rod having first and second end portions, the rod being pivotally secured adjacent its first end portion to one of the subtop and back section for pivotal movement about a horizontal axis spaced from the pivot axis of the back section, the rod having a first curved portion adjacent the first end portion and a second curved portion extending from the first curved portion to the second end portion, the first and second curved portions having opposite curvatures to provide the rod with a generally S-shaped intermediate portion, the second curved portion flowing smoothly from the first curved portion and being longer than the first curved portion, the first curved portion curving away from its pivotal securement to one of the subtop and back section toward the other of the subtop and back section and the second curved portion curving away from said other of the subtop and back section toward said one of the subtop and back section when the back section is in its lowered position,



the length of the second curved portion being such that the first and second end portions form an included angle opening toward said one of the subtop and back section of less than 180°, the rod being enclosed completely within the space between the subtop and the back section when the back section is in the lowered position, a latch plate mounted on the other of the subtop and the back section for pivotal movement about a horizontal axis, the latch plate having an opening therethrough slightly greater than the thickness of the rod, the rod extending through the opening in the latch plate and the periphery of the opening in the latch plate being engageable with the rod when the latch plate is moved away from a perpendicular relationship with the rod whereby the latch plate can be frictionally locked against the rod at selected positions along the first and second curved portions of the rod to support the back section at a desired inclination, the rod being pivotable between the subtop and the back section as the back section is moved between the lowered and raised positions without interfering with the subtop or the back.

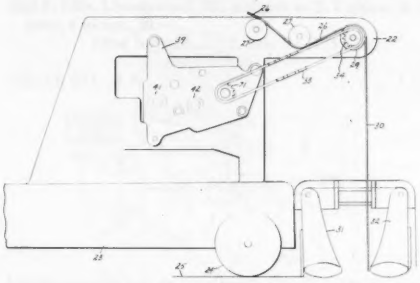
3,870,290
PHASE SHIFTING DEVICE FOR CLOTH LAYING CARRIAGE

Stephen Paterson, Forest Hills, N.Y., assignor to Cutting Room Appliances Corp., New York, N.Y.

Continuation-in-part of Ser. No. 145,194, June 20, 1971, abandoned. This application Jan. 4, 1973, Ser. No. 320,978
Int. Cl. B65h *22/46*
U.S. Cl. 270—30 **2 Claims**

1. In a cloth laying machine carriage of a type including a positively driven feed roller having an outer surface, which roller rotates in a single direction and is driven by means responsive to movement over a cloth laying table in either of two opposite directions, said carriage having a pair of movably mounted fold-forming bars having spaced guiding edges which selectively guide a web of cloth from said driven roller beneath a catcher bar positioned to fall thereupon, improved means for preventing the accumulation of cloth caused by continued rotation of said feed roller during movement of said carriage caused by the reversal of direction of movement of

said carriage at the completion of a cloth laying cycle and the commencement of another cloth laying cycle in which a previously inactive fold-forming bar of said pair of bars moves into active position and subsequently moves against a surface of said web, said means comprising lost motion means interconnecting said feed roller and said means responsive to movement operative upon reversal of the direction of said move-



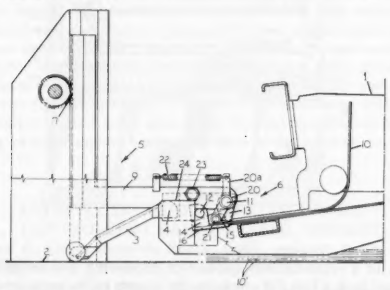
ment, said lost motion means interrupting the continuous rotation of said feed roller for a predetermined length of the path of travel of said carriage at either end of said cloth laying table corresponding to the distance between the cloth guiding edge of an inactive fold-forming bar and the point at which said bar contacts said web following the commencement of movement of said carriage at the beginning of a cloth laying cycle.

3,870,291

CLAMP DEVICE FOR LAYING-UP MACHINES SUITABLE TO KEEP EACH LAYER OF FABRIC DURING ITS LAYING-UP

Mario Fonio, Via Ticino 131, Galliate, Italy

Filed Apr. 6, 1973, Ser. No. 348,605
Claims priority, application Italy, Apr. 22, 1972, 23460/72
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 **4 Claims**



1. In a fabric laying-up machine of the type having a supporting table and a carriage with a fabric supply movable to and fro on the table for tentering and cutting successive layers of fabric of pre-determined length on the table, a fabric clamping device comprising:

a. clamping means adjacent one end of the table for receiving the end of a supply of fabric presented by the carriage including separately mounted cooperating series of clasps with means mechanically linking said clasps one to the other;

b. means movable with the carriage to effect actuation of said clamping means;

c. operating means operatively associated with one series of said clasps and with said actuating means to effect gripping and release of each layer of fabric; and

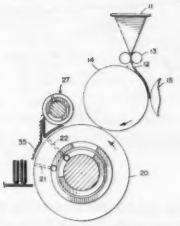
d. means included with said clamping means to be operatively contacted by said actuating means to cause raising of the clamping means during the tentering of a layer of fabric an amount preventing interference of each new layer with the previous tentered layer of fabric.

3,870,292

METHOD AND APPARATUS FOR TRANSVERSE FOLDING OF WEBS

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 16, 1973, Ser. No. 341,843
Int. Cl. B65h *45/14*
U.S. Cl. 270—68 R **1 Claim**

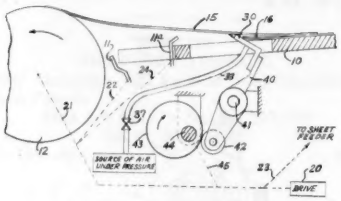


1. In a method of producing napkins, hankies or the like from an elongated web, the steps of advancing a continuous web into wrapping engagement on a rotating carrier roll, severing said web on said carrier roll to provide a sequence of separate web segments while temporarily maintaining each segment in general wrapping engagement with said carrier roll, rotating a first folding roll adjacent to and in synchronism with said carrier roll and in a direction opposite the direction of rotation of said carrier roll, applying vacuum to a first vacuum port in said first folding roll when a midlength portion of each segment on said carrier roll is aligned with said first vacuum port to start withdrawing each segment from said carrier roll while forming a first transverse fold of each segment about a first fold line located at the midlength of each segment, continuing rotating said first folding roll while causing each web segment portion immediately behind said first transverse fold line to move in a path diverging from the rotation of said carrier roll and thereby bring the trailing portion of each web section behind said first transverse fold line into engagement with said first folding roll with the previously leading portion superimposed thereon, then applying vacuum to a second vacuum port in said first folding roll, said second vacuum port being located behind said first vacuum port approximately one-quarter legnth of a web segment while continuing to apply vacuum to said first port whereby for a discrete time the said trailing portion is held against said first folding roll by simultaneous application of vacuum to both of said ports, thereafter substantially simultaneously terminating the application of vacuum to said first port and applying vacuum to a port in a second folding roll positioned adjacent said first folding roll to bring the leading edge of each web segment adjacent said first transverse fold into wrapping engagement with said second folding roll and to positively divert said leading edges from wrapping engagement with said first folding roll to commence the development of a second transverse fold adjacent said second port, thereafter terminating the application of vacuum to said second folding roll port while continuing to apply vacuum to the second port of said first folding roll, urging the portion of each web segment diverted by said second folding roll into general conformity with the trailing portion remaining held by said second vacuum port on said first folding roll, and terminating the application of vacuum to said second port and removing in generally planar configuration the twice transversely-folded segment from engagement with said first folding roll.

3,870,293
DEVICE FOR ALIGNING THE SHEETS ON THE FEED TABLE OF SHEET-FED MACHINES, PARTICULARLY OFFSET PRINTING PRESSES

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik & Schleicher AG., Offenbach/Main, Germany

Filed Sept. 20, 1973, Ser. No. 399,452
Claims priority, application Germany, Sept. 20, 1972, 2246140
Int. Cl. B65h 9/14
U.S. Cl. 271—231 **3 Claims**



1. In a sheet feeding means for a printing press, the combination comprising a feed table having front guides and having an associated impression cylinder adjacent the guides and equipped with grippers, means for feeding sheets onto the table in overlapped relation with the top sheet leading and the bottom sheet trailing, a sheet separator head recessed with respect to the table and extended horizontally in the direction of movement of the sheets, said head having a horizontal passageway therein flaring in the direction of motion of the sheets and terminating in a generally horizontally directed nozzle, means for applying pressurized air to the passageway for formation of a jet of air at the nozzle, the upper surface of the head having a suction port rearwardly adjacent the nozzle so that when air is ejected from the nozzle there is produced by the Bernoulli principle downward suction in a direction substantially perpendicular to the jet, means for cyclically rocking the head about a transverse axis timed with the feeding of the sheets so that the head is upwardly tilted with the result that the air jet is directed from the nozzle with a vertical component for blowing the top sheet clear of the bottom sheet and so that the head is subsequently restored to near horizontal position to present the suction port to the bottom sheet so that the bottom sheet is prevented from being drawn along with the top sheet as the latter is removed by the grippers on the impression cylinder.

3,870,294
APPARATUS FOR THE EXTRACTION OF SHEETS

Sigmar Donner, Augsburg, Germany, assignor to Kleindienst & Co. Maschinenfabrik, Augsburg, Germany

Filed Jan. 17, 1973, Ser. No. 324,355
Claims priority, application Germany, Jan. 26, 1972, 2203626
Int. Cl. B65h 1/30, 3/04
U.S. Cl. 271—3.1 **8 Claims**

1. An apparatus for feeding sheets to a processing unit, comprising:

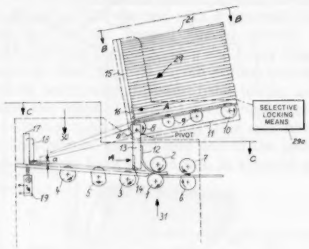
a magazine adapted to receive a main stack of sheets of variable height and having a support surface at the bottom of the magazine and an outlet at said surface for passing sheets from the bottom of said main stack in one direction;

first feed means for advancing sheets from the bottom of said main stack through said outlet in said direction;

a further surface disposed below the first-mentioned surface and ahead of said outlet in said direction for receiving a minor stack of sheets, said first surface being inclined at an acute angle to said further surface;

an abutment extending generally transversely to said further surface remote from said outlet for intercepting leading edges of sheets fed through said outlet and depositing same upon said further surface in said minor stack with the sheets thereof aligned along said edges;

second feed means for drawing the lowermost sheet from said minor stack and advancing same beneath said magazine in the opposite direction with the aforementioned edges of the sheets withdrawn from said minor stack trailing in said opposite direction; and

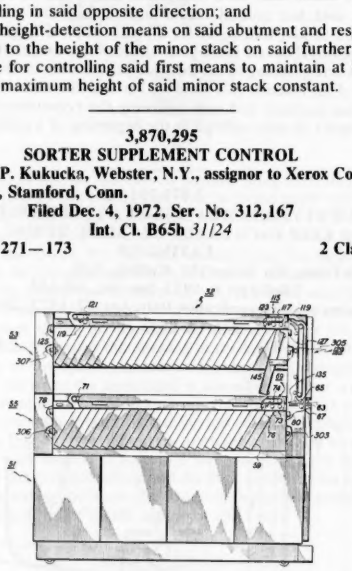


stack-height-detection means on said abutment and responsive to the height of the minor stack on said further surface for controlling said first means to maintain at least the maximum height of said minor stack constant.

3,870,295
SORTER SUPPLEMENT CONTROL

William P. Kukucka, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1972, Ser. No. 312,167
Int. Cl. B65h 31/24
U.S. Cl. 271—173 **2 Claims**



1. In a reproduction system for producing and collecting copies from a set of documents, the system including a processor and a collator, said collator having at least one copy storage section with trays for receiving copies therein, the improvement comprising:

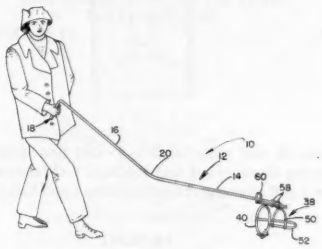
means for programming said system to provide a preset number of document copies arranged in collated order in said collator section,

copy sensing means including a light source and light responsive means in alignment with said light source in said collator, presence of a copy in said collator trays blocking passage of light from said light source to said sensing means,

control means to prevent start-up of said system unless said sensing means senses the light from said light means, and means adapted when actuated to override said control means to permit copies in addition to said preset number

of document copies to be arranged in the trays of said collator section together with said preset number of document copies produced from said program.

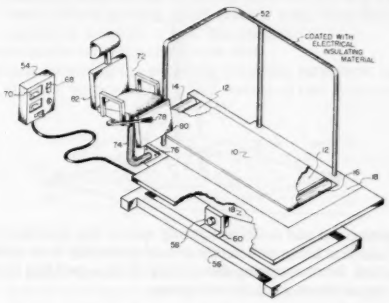
3,870,296
NOVELTY AND AMUSEMENT DEVICE SIMULATING AN ANIMAL LEASH
Joel F. Ellis, Lincolnwood, Ill., assignor to H. Fishlove & Company, Chicago, Ill.
Filed Nov. 10, 1972, Ser. No. 305,576
Int. Cl. A63j *5/00*
U.S. Cl. 272—8 N **1 Claim**



1. A novelty and amusement device so constructed and arranged to be held by a person and simulating an animal leash and conveying the impression to observers that an animal such as a dog or the like formerly secured to the leash has escaped therefrom with the person holding the leash being unaware of said escape, said device comprising a longitudinal non-extendible rod member of substantial length with a handle portion adjacent the rear thereof, an animal harness secured to the front end thereof, and a substantial distance forwardly of the handle portion, said harness being of conventional appearance and being so shaped and constructed as to be the type of harness that an animal could be harnessed in when leashed, said device simulating an animal leash to be held by a person so that the harness is held spaced from the ground surface, said harness at all times being free of securement to any animal, simulated animal, or portion of any simulated animal, said rod member being preformed into a shape which gives the appearance that a dog or other animal was still leashed to the harness, and said rod member being generally rigid to maintain said shape but sufficiently flexible and resilient so that when held by a person the rod member will tend to move up and down simulating the movement as though a dog or other animal was still leashed to the harness.

3,870,297
EXERCISE TREADMILL WITH INCLINATION CONTROLLED CHAIR MOUNTED THEREON
Boyd B. Elder, Redondo Beach, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.
Division of Ser. No. 371,066, June 18, 1973, Pat. No. 3,826,491. This application Feb. 19, 1974, Ser. No. 443,623
Int. Cl. A63b *23/06*
U.S. Cl. 272—58 **1 Claim**

1. A treadmill for diagnostic and therapeutic purposes, and the like, including: a base; a frame pivotally mounted on said base; a pair of rollers mounted on said frame in spaced and parallel relationship; platform means interposed between said rollers and mounted on said frame to define a walking surface; an endless belt looped around said rollers and over said platform means; a drive mechanism mechanically coupled to said belt; an inclination control mechanism coupled to said frame including means to change the inclination of the walking surface relative to said base; a chair mounted on the frame adjacent said belt and to one said thereof; and a linkage mechanism coupled to the chair and to the frame including means for controlling the inclination of said chair as the inclination of the walking surface is changed, so that an established relationship between the plane of the seat of the chair and the base remains the same regardless inclination of the walking surface relative to the base.



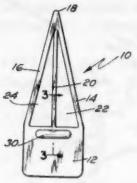
3,870,298
BALLOON BALANCING TOY
Zoltan Varga, 2561 S. Clement Ave., Milwaukee, Wis. 53202
Filed June 24, 1974, Ser. No. 482,384
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **3 Claims**

1. A balancing toy comprising an elongated post, a ring at one end of said post, and an inflatable member having a longitudinal axis substantially greater than its transverse axis centered in said ring and captured by said ring.

3,870,299
COMBINATION GOLF PUTTING AID AND DIVOT REPAIRER
James M. Howe, 9 Scenic View Dr., Johnston, R.I. 02919
Filed Jan. 7, 1974, Ser. No. 431,333
Int. Cl. A63b *57/00*
U.S. Cl. 273—32 B **5 Claims**

1. A device for aligning a putt on a golf putting green, comprising a base portion of relatively flat stock, an elongated sighting rod integrally joined to said base portion in coplanar relation therewith and extending at right angles with respect thereto, said sighting rod normally projecting upwardly from said base portion when said device is in a position of use, a leveling element fixed to said base portion so as to be adjacent to the bottommost end of said sighting rod when said device is in the position of use, said leveling element being oriented with respect to said sighting rod in the position of use such that the midpoint of said leveling element is located in alignment with said sighting rod, and opposed legs joined to said base

portion in spaced relation with respect to said sighting rod and located in coplanar relation with respect to said base portion and sighting rod, spaces being formed between said legs and



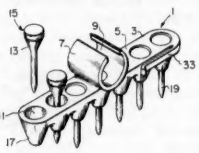
sighting rod and defining sighting spaces, the outermost ends of said legs being sufficiently spaced outwardly from said base portion for cooperating therewith to form a tool that is usable to repair divot marks in said green.

3,870,300

GOLF TEE HOLDER USABLE TO FORM A RAKE

Warren R. Amendola, 357 W. Neck Rd., Lloyd Harbor, N.Y. 11743

Filed May 6, 1974, Ser. No. 467,314
Int. Cl. A63b *57/00*
U.S. Cl. 273—32 B **8 Claims**



1. In a golf tee holder having a plurality of spaced identically shaped bores for receiving complementarily shaped portions of respective golf tees to be held, the improvement comprising:

a. an elongated spine through which said bores are provided, said bores having axes of symmetry which are respectively perpendicular to the length direction of said spine and which lie in a common plane, the shape of said bores being complementary to that of the respective head portions of the golf tees to be held; and

b. a generally cylindrical split ferrule integral with said spine and disposed athwart said spine midway between the spine ends for temporarily attaching said tee holder to a golf club shaft by frictional engagement of the ferrule interior with a grip on said shaft, said ferrule being in substantially tangential relationship to a spine surface at which the golf tees to be held are insertable in said bores, said tee holder, when holding a full complement of golf tees, thereby serving as a rake head whose tines are the respective pointed shaft portions of said tees.

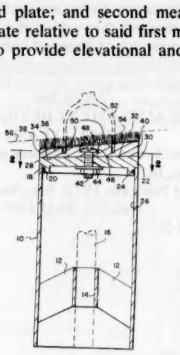
3,870,301

GOLF BALL PUTTING CUP

Lynam S. Brisendine, 1901 W. 3rd St., Mesa, Ariz. 85202

Filed Jan. 11, 1974, Ser. No. 432,804
Int. Cl. A63b *69/36, 57/00*
U.S. Cl. 273—34 B **8 Claims**

1. In a synthetic turf cap for golf ball cups used on golf course greens, the invention comprising: a golf ball cup having an open upper end, a cap on said upper open end; first means on said open end of said cup for supporting said cap at said open end of said golf ball cup; said cap having a plate disposed in close proximity to said upper open end of said cup; synthetic turf on said plate; and second means for adjustably supporting said plate relative to said first means; said second means disposed to provide elevational and inclinational adjustment of said plate relative to said first means, thereby permitting alignment of said synthetic turf relative to natural turf on a golf course green surrounding a golf ball cup thereon.

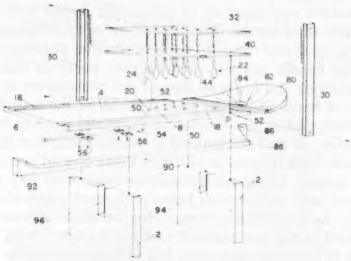


3,870,302

TETHERED PINS BOWLING GAME APPARATUS

Anthony E. Redling, 1727 Kalakaua Ave., Apt. A-4, Honolulu, Hawaii

Filed Sept. 8, 1972, Ser. No. 287,522
Int. Cl. A63d *5/08*
U.S. Cl. 273—44 **10 Claims**



1. Bowling game apparatus comprising a frame, a flat rectangular alley supported on the frame, the alley having a proximal ball-releasing end, a pin-receiving area near a distal end, a plurality of upstanding guides connected to the frame near the pin-receiving area of the alley, a platform connected to upper extremities of the guides, a reset plate mounted between the alley and the platform and mounted between the guides for vertical movement, followers mounted on the reset plate and extending laterally therefrom adjacent the guides for engaging the guides, whereby movement of the reset plate between the alley and platform is controlled by the guides and followers, bowling pins positioned on the pin-receiving area of the alley, and spring means connected to upper ends of the bowling pins and extending through holes in the reset plate and connected to the platform for drawing the pins upward toward openings in the reset plate, ten magnets arranged in spaced triangular planform in the pin-receiving area with alternate magnets having opposite polarity at an upper surface of the pin-receiving area, and wherein the bowling pins comprise ten pins arranged in complementary triangular form with second magnets in the pins having alternated polarity opposite the polarity of corresponding first magnets in the pin-receiving area, for holding the pins downward against spring pressure on the pin-receiving area of the alley, whereby knocking a pin toward an alternate magnet results in repulsion of the pin by

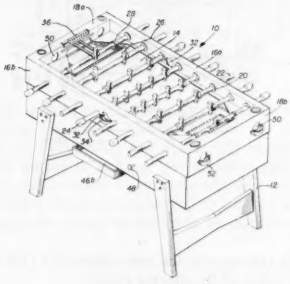
the alternate magnet, whereby when the pins and second magnets are forced away from the first magnets the pins are drawn upward toward the reset plate by the spring means, and whereby the pins are reset on the pin-receiving area by moving the reset plate downward until the pins touch the area and then moving the reset plate upward, leaving the pins held by magnets on the area.

3,870,303

SOCCER TABLE WITH GOAL AND PENALTY OPENING

Lawrence T. Patterson, Jr., Cincinnati, Ohio, assignor to Patterson International Corporation, Cincinnati, Ohio

Filed Feb. 26, 1970, Ser. No. 14,502
Int. Cl. A63f 7/06
U.S. Cl. 273—85 D **1 Claim**



1. In a game table of the type having a recessed playing surface and a plurality of balls to be used thereon, opposed side and end members on said playing surface, a series of bars mounted parallel to each other and said end members through said side members, said bars being rotatable and movable longitudinally of said side members, and normal thereto, a plurality of figurines fixedly attached to said bar members adjacent said playing surface, a goal pocket located in each of said end members, and a common chamber communicating with said goal pockets; the improvement, in combination therewith, comprising at least one penalty pocket adjacent each side of said goal pockets, each penalty pocket comprising a perforation extending through at least a portion of its respective end member near a corner thereof and leading to ball retaining means, the adjacent corners of said recessed playing surface being upturned and said perforations being flush therewith, said common chamber being centrally positioned beneath said playing surface and extending outwardly beyond one of said side members, a pair of baffles positioned on each side of said common chamber which communicate with one of said goal pockets, each of said pairs of baffles being mounted on an inclined surface leading from one of said goal pockets to said common chamber, a pivoted button member dividing said common chamber into a first portion, which communicates with said goal pockets through said pairs of baffles, and a second portion comprising said ball retaining means, said second portion including said outwardly extending portion and duct means communicating between each one of said perforations and said second portion of said common chamber.

3,870,304

INFLATABLE STRIKING MEMBER AND PROJECTILE DISPENSING RECEPTACLE

George D. Minnick, 468 Manor St., Lancaster, Pa. 17603

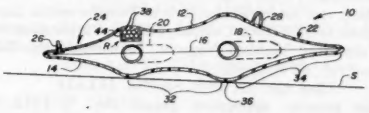
Filed Dec. 26, 1973, Ser. No. 428,018
Int. Cl. A63b 71/02
U.S. Cl. 273—95 R **10 Claims**

10. A game device comprising:

an inflatable structure having upper and lower surfaces, the upper surface having spaced apart first and second portions, said lower surface having a first portion which normally supports the inflatable structure in a first plane and a second portion which extends away from the first portion at an angle to said first portion,

a projectile receiving receptacle, and

means mounting the projectile receiving receptacle upon the first portion of the upper surface of said structure at



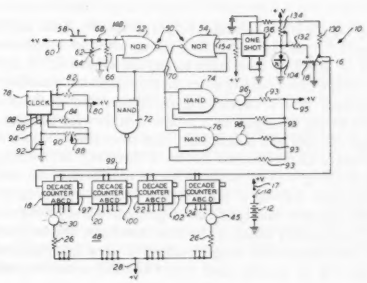
a point remote from the intersection of the first and second portions of said lower surface, and second portion of the upper surface being disposed above the second portion of the lower surface, the parts being so arranged and constructed that when the second portion of the upper surface receives a blow the structure will pivot about the intersection of the first and second portions of the lower surface to move the receptacle upwardly and cause any projectiles within the receptacle to be projected upwardly.

3,870,305

LIGHT RAY GUN AND TARGET INCLUDING ELAPSED TIME COUNTER

Thomas J. Harclerode, 1817 Crest Dr., Hagerstown, Md. 21740

Filed May 4, 1973, Ser. No. 357,100
Int. Cl. A63f 9/02
U.S. Cl. 273—101.1 **9 Claims**



1. Apparatus for testing of target shooting ability, comprising in combination:

A. a hand-held light gun adapted to project a beam of light along a course cited by the operator thereof; and

B. a light activated target and timing system comprising:

1. photo receptor target means providing an output upon being struck by said light beam;
2. digital clock means;
3. digital counter means for receiving the output pulses from said clock means;
4. first gating means connected between said clock means and counter means;
5. starter means for opening said gate means to start said counter means;
6. means responsive to the output from said photo receptor means for closing said first gating means to stop said counter means;
7. display means connected to the output from said counter means for accepting the cumulative count

thereof, and displaying to said operator the total elapsed time between opening and closing of said first gating means; and

8. means to reset said counter means and dislay means upon conclusion of a testing period.

3,870,306

ARTIFICIAL TARGET RECOVERY AND DELIVERY EQUIPMENT FOR USE IN NEW SHOOTING GAME

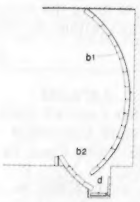
Hideo Iino, and Satoru Iizuka, both of Tomobe-machi, Japan, assignors to SKB Arms Company; Comet Corporation, both of Tokyo and Yoshiaki Noguchi, Tokushima-City, Tokushima-Pref., all of, Japan

Filed Apr. 23, 1973, Ser. No. 353,633

Claims priority, application Japan, Dec. 7, 1972, 47-122007; Jan. 19, 1973, 48-07850; Jan. 31, 1973, 48-11906

Int. Cl. F41j 9/16

U.S. Cl. 273—105.6 **1 Claim**



1. An artificial inanimate target recovery and delivery equipment for use in a shooting game wherein a light beam gun and an artificial inanimate target are employed in combination, which comprises in operative connection a cushioning wall member and a cushioning floor member both of said members being arranged in a concave state viewed from the front side thereof and located in areas over which said artificial inanimate target thrown out by a throwing device ranges, said cushioning wall member being in the form of an endless belt conveyor having a plurality of ridges and adapted to resiliently capture said artificial target, and a conveying means located operatively adjacent to said members, and adapted to receive and deliver said target coming to drop from said members, thereby to convey said target toward a predetermined point of recovery.

3,870,307

PIN BALL GAME APPARATUS

Burton C. Meyer, Downers Grove, and Marvin I. Glass, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 21, 1973, Ser. No. 334,416

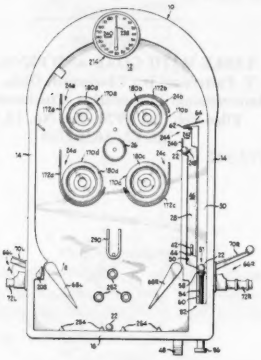
Int. Cl. A63f 7/10

U.S. Cl. 273—121 A **13 Claims**

1. In a pinball type game including a housing having an inclined playing surface over which a ball may be propelled, at least one ball to be propelled on said playing surface, a launcher for propelling a ball onto the playing surface, and target means mounted on the playing surface for striking by a ball, the improvement wherein said target means comprises:

an upstanding, generally circular guide rail mounted on the playing surface; and

rotatably driven ball propulsion means mounted at least in part within the circumference of said guide rail for engaging a striking ball and positively propelling said ball from the periphery of said propulsion means along the inside of



the guide rail whereby the ball is directed by the guide rail to other areas of the playing surface.

3,870,308

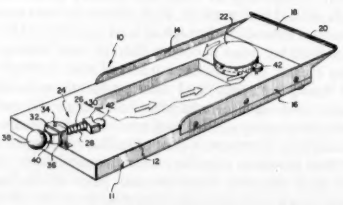
MAGNETIC TARGET AND DISC SURFACE PROJECTILE GAME APPARATUS

Jerry Reilly, Blandford Dr., Sudbury, Mass. 01776

Filed Dec. 26, 1972, Ser. No. 318,496

Int. Cl. A63f 3/00

U.S. Cl. 273—126 A **8 Claims**

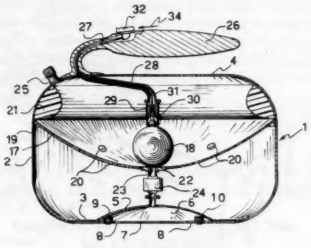


1. An amusement apparatus which comprises a base member providing a substantially smooth playing surface having front and rear ends, at least one non-rotating stationary cylindrical target magnet element positioned at one end of said playing surface, a cylindrical projectile magnet element which can be projected along said playing surface toward said target magnet element, said elements arranged on said playing surface so that the polarity of the surface of the target magnet element and the polarity of the surface of the projectile magent element which communicates with said playing surface are opposite each other so that the target magnet element and the projectile magnet element are in attracting relationship and proper contact between said elements can cause said projectile magnet element to spin about the periphery of said target magnet element, and means to propel said projectile magnet element toward said target magnet element.

3,870,309
SLIDING GAME PIECE HAVING FRICTION REDUCTION AIR CUSHION

Joseph Donatien Leo Tessier, 1 Guevremont St., Drummondville, Quebec, Canada

Filed Nov. 20, 1973, Ser. No. 417,538
Int. Cl. A63b *71/00*
U.S. Cl. 273—128 CS **14 Claims**

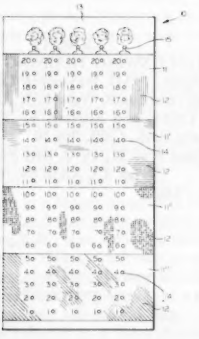


1. A sliding game piece comprising a body forming a bottom face having gas outlet means therein, gas supply means mounted onto said body and operatively connecting to said gas outlet means to exhaust gas therethrough, and inertia-responsive valve means connecting said gas supply means to said gas outlet means and arranged to control said exhaust of gas through the latter in response to displacement of said body.

3,870,310
GAME BOARD PRIMARILY FOR SMALL CHILDREN

Richard Jeffery, 4347 Packard Ave., Cudahy, Wis. 53110

Filed Sept. 6, 1973, Ser. No. 394,955
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 BA **5 Claims**

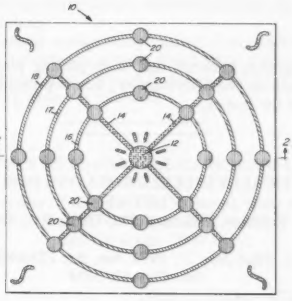


1. A game board for a number of players, the game board comprising rows and columns of holes with a start line at a first of said rows and a goal line at the last of said rows, each column of holes being assigned to one of said players, a plurality of periodic background bands each containing a plurality and predetermined number of said rows of said holes, whereby successive plays comprises a selection of any hole in the next successive background band, control means comprising a separate board used by a player who is "it," the separate control board containing a duplicate column of holes having duplicate periodic background bands, the total number of holes and the area of the separate control board being substantially less than the total number of holes and the area of the game board, each band on the separate control board corresponding to a band on the game board, the separate control board providing means for storing a memory of successive positions selected by a player who is "it," and marker means which each player and the player who is "it," and marker means which each player and the player who is "it" may successively position in the column assigned to him for play whereby a player is "out" if he plays a position on the game board corresponding to a position on the separate control board which is selected by the player who is "it."

3,870,311
BOARD GAME APPARATUS

George A. Klupp, Billings, Mont., assignor to Myrla Bratton, Billings, Mont.

Filed Apr. 22, 1974, Ser. No. 463,156
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 AB **2 Claims**



1. In a game device, the combination of a playing surface having a central circle and a plurality of concentric larger circles surrounding and spaced from each other and from said central circle, four movement lines radiating from the central circle to the outermost concentric circle, each of the four lines being 90° from its next adjacent line, a plurality of dots, one at each intersection of each concentric circle with movement lines, an attacker or predator fox-like figurine for one player, or one team, and plural, identical, pursued geese-like figurines for the opposing player, or opposing team, one for each of the concentric circles outside the central circle, and one more dot on each concentric circle placed at each intersection of imaginary bisectors of the angles between adjacent movement lines with the concentric circle, the central circle and the movement lines being color coded in a first color, the concentric circles being color coded in a second color, and the dots being color coded in a third color.

3,870,312
GAME

Douglas A. Hamar, 0236 S.W. Palatine Hill Rd., Portland, Oreg. 97219

Filed July 10, 1974, Ser. No. 487,276
Int. Cl. A63f *3/00*; **A63h** *33/04*
U.S. Cl. 273—135 F **3 Claims**

1. A game comprising in combination,

a game board having groups of projections uniformly spaced from one another on the upper surface of the board,

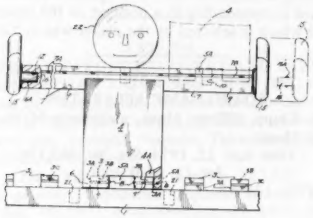
body playing pieces having horizontally projecting arms,

discrete hand playing pieces for placement on said arms,

discrete head playing pieces for placement on said body playing pieces,

each of said body playing pieces defining a recessed area adjacent its lower end permitting inserted engagement with some of said projections retaining the body playing piece upwright against lateral loads, and

each of said body playing pieces additionally defining cut-out areas for engagement with the arms of a subjacent board mounted body playing piece during the course of play, means



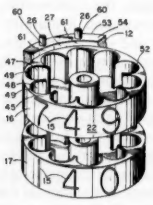
interengageable between said body playing pieces and the arms of said second body playing piece to prevent subsequent tipping of the bodies.

3,870,313

MAGNETICALLY INDEXED ROTATING DISKS CHANCE DEVICE

Philip J. Rowman, Hillsboro Pk., Derry Rd., Hudson, N.H. 03051

Filed July 27, 1972, Ser. No. 275,688
Int. Cl. A63f *5/04*
U.S. Cl. 273—143 C **6 Claims**



1. In an amusement apparatus of the type having a shaft within a housing upon which a plurality of disks are supported, each disk carrying a plurality of different characters spaced thereon the improvement comprising:

said housing being vertical and formed by a one piece hollow cylindrical shell of heavy metal, having a sealed bottom closure of said metal and a vertically extending flat chordal planar face in the side wall thereof with a vertically extending opening therein,

said shaft being vertical and removably, but non-turnably mounted within said housing and extending along the central vertical axis thereof,

said disks being heavy and mounted on said shaft within said housing, for independent rotation in horizontal planes around said vertical axis, each said disk having an arcuate portion protruding into said opening, slightly beyond said flat planar face to permit turning thereof by the fingers of an operator and

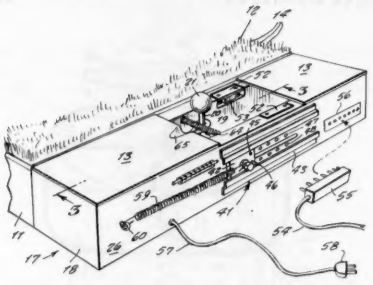
permanent magnet means of varying magnetic susceptibility operably associated with each said disk so as to cause each said disk to be indexed with a character disposed in said opening, said varying magnetic susceptibility serving to vary the frequency with which said characters will stop in said opening.

3,870,314

GOLF PRACTICE MACHINE

Dominick Bertucci, 153 Wilderness Rd., Saint James, N.Y. 11780

Filed Apr. 8, 1974, Ser. No. 458,544
Int. Cl. A63b *69/36*
U.S. Cl. 273—185 D **3 Claims**



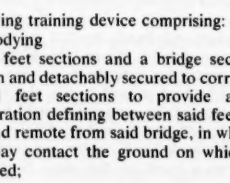
1. In a golf Practice Driving Range the combination of a base upon which a golf player can stand, an operative unit in said base, including a housing having a slot on its top side, an upstanding shaft protruding upwardly through said slot, a ball secured on an upper end of said shaft for being struck by a golf club held by said player and means for indicating a quality of a driving force by said player to said ball, said means comprising a scoring unit separately located from said base, and an electric circuit including switch means in said operative unit activated by movement of said ball, and lamp indicating means in said scoring unit, said ball shaft being pivotable about a cross shaft slidable in slots of sidewalls of a housing of said operative units, said cross shaft carrying electrical contacts engagable with sets of stationary contacts of said housing, said contacts sets being in circuit with different ones of a set of differently identified lamps of said scoring units.

3,870,315

GOLF SWING TRAINING DEVICE

Robert E. Lawlor, 19341 Weymouth Ln., Huntington Beach, Calif. 92646; Carlton B. Watson, Jr., 23 Richlee Dr., Camillus, N.Y. 13031, and Michael E. McGill, 8245 Graham Green, Buena Park, Calif. 90620

Filed May 21, 1973, Ser. No. 362,278
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 R **6 Claims**



6. A golf swing training device comprising:

a base embodying

a pair of feet sections and a bridge section extending between and detachably secured to corresponding ends of said feet sections to provide a base of U-configuration defining between said feet a space open at its end remote from said bridge, in which a golf club head may contact the ground on which said base is supported;

and a pair of sensors detachably secured to said base, at least one of said sensors being attached near the area of attachment of a respective foot to said bridge section;

said one sensor being a bar having an obtuse-angle bend intermediate its ends to provide a shank which is attached to the base, and a tusk extending obliquely from the free end of said shank, said shank extending generally parallel to the major axis of the base, and said tusk diverging from said axis;

and connector means attaching said base sections to one another, at least one of said connector means also functioning to mount said one sensor bar to the base and providing for adjustment of elevational tilt thereof and for rotary adjustment thereof to vary the direction of oblique extension of said tusk.

3,870,316

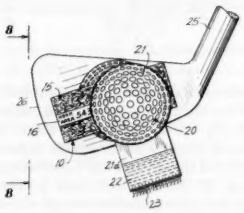
GOLF CLUB SWING TRAINING DEVICE

Ben H. DeBrocke, 41-22-45th St., Apt. 1-A, Sunnyside, Long Island, N.Y. 11105

Filed Mar. 14, 1974, Ser. No. 451,092

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 E **7 Claims**



1. A golf stroke-training device comprising in combination: first and second separate sheet structures each having forward and rearward faces, each having on the forward faces thereof joining means for causing said first and second sheet to adhere to one another when brought into contact with one-another, the forward face of the first sheet being of predetermined height and length dimensions smaller than and substantially corresponding to the area of a ball-striking face of a golf club, the first sheet's forward face including indicia means serially programming variations in a height dimension and serially programming variations in a length dimension corresponding respectively to vertical and lateral dimensions of a striking face of a golf club, the first sheet including attaching means for attaching the first sheet's rearward face to a ball-striking face of a golf club, the second sheet having broad face thereof an area substantially corresponding to that of a golf ball, and support means for mounting the second sheet in a substantially upright position relative to a substantially horizontal support surface.

3,870,317

BODY GUIDE FOR ATHLETIC CLUB SWINGING TRAINING

Bradford W. Wilson, 4676 Noyes St., Apt. E, San Diego, Calif. 92109

Continuation of Ser. Nos. 63,440, Aug. 13, 1970, abandoned, and Ser. No. 293,385, Sept. 29, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 421,054

Int. Cl. A63b *53/04*

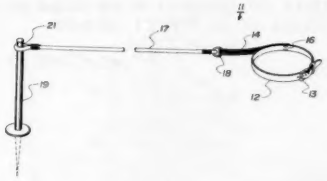
U.S. Cl. 273—188 R **1 Claim**

1. An athletic swing trainer comprising:

a relatively wide belt of sufficient extent to encircle the waist of an athlete;

only a single elongated elastomeric section attached at one end to said belt at one point only, said section being

1. tangential to the said belt when said belt encircles the waist of the athlete while using said swing trainer; and
2. the attachment being at a point on said belt adjacent



to that hip of the athlete which is opposite the swing of the athlete;

said elastomeric section being coupled at its opposite end to a rope connected to a stake which when driven into the ground constitutes a stationary geographic point to which said swing trainer is attached.

3,870,318

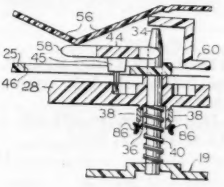
REMOTELY ACTUATED SOUND REPRODUCING DEVICE

Donald B. Poynter, 7 Arcadia Pl., Cincinnati, Ohio 45208

Filed Mar. 1, 1972, Ser. No. 230,875

Int. Cl. G11d *25/04*

U.S. Cl. 274—9 R **21 Claims**

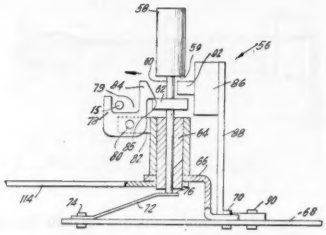


1. A sound reproducing device of the type including a housing having a rotatable and axially shiftable recording disc mounted therein, said disc having a spiral groove in one face thereof with a predetermined configuration for reproducing a recorded message, a movable stylus carried by the housing in a position for selective engagement and disengagement with the groove, means connected with said stylus to move said stylus in response to axial shifting of said disc in a first direction to initiate playback of a recorded message on the disc, a speaker operatively connected with the stylus for generating an audible sound in response to rotation of the disc with the stylus engaged in the groove thereof, remotely actuated means operatively connected with the disc to move the disc axially in said first direction to initiate a cycle of operation, and electrical circuit means including a motor means operatively connected with the disc to rotate the disc when the disc is in its aforesaid first axially shifted position, an axially extending non-conductive projection on said disc coaxial therewith, electrically conductive means carried by the projection and connected in said circuit, and a switch including a pair of electrical contacts connected in said circuit and yieldably biased into engagement with circumferentially spaced portions of said non-conductive projection in a second axial position of the disc, whereat the circuit is deenergized, and biased into engagement with said electrically conductive means in the first axially shifted position of the disc to energize the circuit and cause rotation of the disc for playing of the recorded message.

3,870,319
DICTATING AND PLAYBACK APPARATUS

Henry A. Sherwood, 30 North Road, Short Hills, N.J. 07078

Filed Nov. 21, 1969, Ser. No. 878,800
Int. Cl. G11b 17/06
U.S. Cl. 274—13 13 Claims

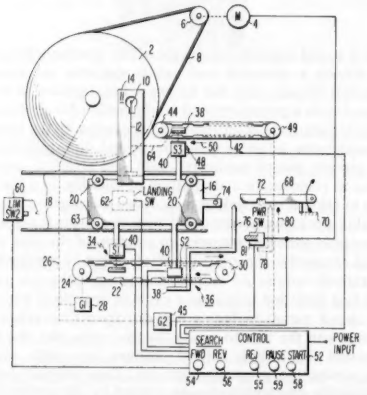


1. A combined recording and playback mechanism adapted to be utilized with pregrooved disc records only comprising a tone arm having a single sound transducer for both recording and playback operation, said transducer being provided with a needle that engages the preformed groove in said pregrooved record for embossing during the recording operation and for the transmission of signals during the playback operation, in addition, means for exerting substantially the same pressure on the transducer during both recording and playback operations, means for manually setting the mechanism for recording operation and automatically setting the mechanism for playback operation, and in which the means for automatically setting the mechanism for playback operation are operably actuated by the lifting of the tone arm.

3,870,320
PICKUP ARM CONTROL FOR VIDEO DISC PLAYER

Leslie Albert Torrington, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,168
Int. Cl. G11b 3/22, 25/04
U.S. Cl. 274—23 A 13 Claims

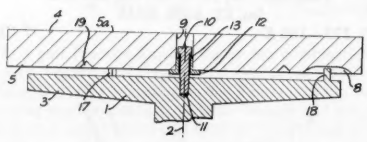


1. Apparatus for controlling a movable transducer assembly with respect to a disc type record medium, comprising:
a first drive belt;
means for driving said first belt at a first given velocity;
a second drive belt;
means for driving said second belt at a velocity different from said first given velocity;
a first means arranged to selectively couple said transducer assembly to different portions of said first drive belt for providing motion to said assembly toward and away from the center of said disc; and
a second means arranged to selectively couple said transducer assembly to portions of said second drive belt for providing motion to said transducer assembly toward the center of said disc.

3,870,321
DISC MOUNTING ARRANGEMENT

Colin Howard Stanwell Smith; Alexander Bennett Gosling, and Donald George Buchanan, all of London, England, assignors to Decca Limited, London, England

Filed Aug. 1, 1973, Ser. No. 384,637
Claims priority, application Great Britain, Aug. 9, 1972, 37208/72
Int. Cl. G11b 3/60
U.S. Cl. 274—39 A 6 Claims

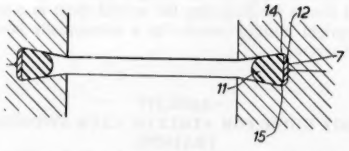


1. A rotary assembly comprising in combination a drive member which is rotatable about an axis and a driven member which is rotatable by the drive member about said axis by means of a balanced three-point kinematic support, wherein the support consists of three parts each consisting of a ridged projection on one of the members and a complementary notched region in the other member, two of the said notched regions are disposed on a circle centred on the said axis and the third notched region is directed radially with respect to the said axis.

3,870,322
FLUID-TIGHT SEALS AND METHODS OF MAKING THEM

John Stephen Marshall, Woking, England, assignor to Sperry Rand Limited, London, England

Filed Oct. 19, 1973, Ser. No. 407,968
Claims priority, application Great Britain, Oct. 19, 1972, 48171/72
Int. Cl. F16j 9/00; F16l 21/02
U.S. Cl. 277—167.5 10 Claims

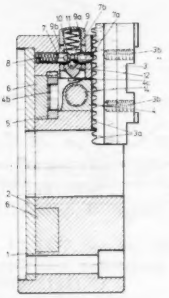


1. A pressure-tight O-ring seal between two surfaces comprising an annular recess having a cylindrical outer wall and a pair of side walls, said outer wall merging by curves into the side walls of the recess, an O-ring in said recess, a thin collar of a plastics material which is flexible but does not flow under the conditions in which the seal is required to operate, said collar surrounding said O-ring, the width of the collar being slightly greater than the axial width of said recess such that said collar is deformed at its contact with the side walls.

3,870,323
CHUCK

Heinz Beckers, Viersen, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed Aug. 20, 1973, Ser. No. 389,590
Claims priority, application Germany, Aug. 19, 1972, 2240871
Int. Cl. B23b *31/16*
U.S. Cl. 279—112 **5 Claims**

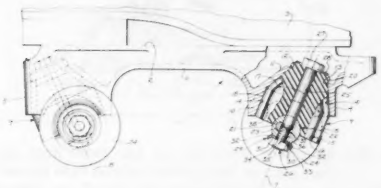


1. A chuck for turning machines, which includes: a chuck body, a plurality of clamping jaws provided with teeth and radially movably supported by said chuck body, adjusting means respectively associated with said clamping jaws and selectively movable in said chuck body into a first section of its path of movement which first section represents the working range of said adjusting means for engagement with and adjustment of the pertaining clamping jaw, said adjusting means also being movable into a second section of its path of movement out of said working range to thereby disengage the respective pertaining clamping jaw and permit removal and exchange of the latter, a plurality of holding pin means respectively associated with said clamping jaws and operable to engage a tooth space of the pertaining clamping jaw for holding the same in its respective adjusted position, said holding pin means also being operable to disengage the tooth space of the pertaining clamping jaw to permit other adjustments and also the removal and exchange of the respective clamping jaw, and locking means operable automatically in response to said adjusting means occupying said second section to prevent withdrawal of said holding pin means from the respective tooth space of the teeth of the pertaining clamping jaw, said locking means including manually operating means for making said locking means ineffective to thereby allow withdrawal of the respective holding pin means from the respective tooth space of the pertaining clamping jaw, each of said holding pin means having a shank provided with an annular groove, and said holding means including: a first member in the form of a cup having each of two diametrically oppositely located wall portions provided with a slot through which reciprocably extends the respective pertaining holding pin means, a second member arranged within said first member and reciprocable relative thereto, ball means supported by said second member and operable to enter said annular groove for locking the respective pertaining holding pin means, and spring means continuously urging said first and second members to occupy such relative positions with regard to each other as to keep said ball means in locking engagement with the annular groove of the pertaining holding pin means, said first member being provided with recess means arranged in diametrically opposite wall sections of said first member and offset in axial direction of said first member with regard to the position in which said ball means are in locking engagement with the annular groove of the pertaining holding pin means to thereby permit said holding pin means to press said ball means out of said annular groove into said recess means when moving said first member relative to said second member to a position in which said recess means register with said ball means.

3,870,324
ROLLER SKATE CONSTRUCTION

Edward Balstad, Box 90, Cambridge, Wis. 53523

Filed Dec. 17, 1973, Ser. No. 425,153
Int. Cl. A63 *17/02*
U.S. Cl. 280—11.28 **5 Claims**



1. A roller skate comprising:
a. a foot plate,
b. a plurality of sockets extending downwardly from said foot plate,
c. a resilient cushion block disposed in each said socket,
d. a horizontally extending axle support member disposed at the lower end of said block,
e. an axle extending through said support member,
f. skate wheels mounted on the ends of said axle,
g. means to secure said support member to said block, said means comprising:
   1. a bore extending downwardly through said block and said support member,
   2. a bolt disposed in said bore,
   3. a nut on the lower end of said bolt,
   4. and a washer member disposed between said nut and said support,
h. complimentary engaging flats on said bolt and said washer to lock said bolt against rotation due to torque forces occurring during shating,
i. and a recess disposed in the outer wall of said support member remote from said cushion block and with said recess having opposed side walls,
j. said washer being generally rectangular and disposed within said recess and locked against rotation by said side walls.

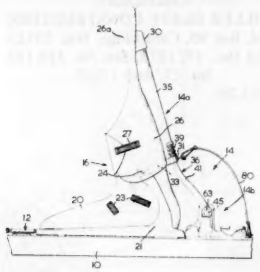
3,870,325
COMBINED SKI BOOT AND BINDING

Edgar H. Davis, 201, 355 Heritage Dr., S.E., Calgary 27, Alberta, Canada

Filed Jan. 29, 1973, Ser. No. 327,432
Int. Cl. A63c *9/086*
U.S. Cl. 280—11.35 N **12 Claims**

2. The combination of claim **1**, wherein said rear binding includes locating means for the heel which limit rearwards movement of boot, and wherein the front binding comprises a support adapted to be permanently attached to the ski by means permitting pivotal movement about a vertical axis, said support having two parallel bores spaced apart on opposite sides of said vertical axis, each of said bores carrying a spring loaded plunger having a projecting end, the boot toe being provided with two laterally spaced, forwards facing depressions for receiving the projecting ends of the plungers, the spring loading of said plungers normally holding said projecting ends thereof in the depressions to hold the toe of the boot in place in normal skiing, the plungers being axially displaceable by an amount sufficient to allow the boot to release by

simultaneous sideways swivelling movement of the boot and of the support beyond a position in which a projecting end of a



plunger lies directly between said vertical axis and the locating means for the heel.

3,870,326

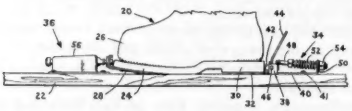
RELEASABLE SKI BINDING WITH REGULATABLE TOE RELEASE MECHANISM

Mitchell H. Cubberley, Nutley, N.J., assignor to Cubco, Inc., Nutley, N.J.

Filed Apr. 2, 1973, Ser. No. 347,117

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **4 Claims**



1. A ski binding having a toe release mechanism comprising:

a toe post member having:

a first portion adapted to engage a toe plate of a ski boot; and

a second portion adapted to engage resilient means;

resilient means contacting said second portion of said toe post member to urge said first portion of said toe post member toward engagement with said toe plate;

fulcruming means connected to said toe post member and having two side surfaces, said fulcruming means coacting with said resilient means to urge said first portion of said toe post member into position for operative engagement with said toe plate;

a housing adapted to be secured to a ski and enclosing at least a portion of said toe post member and said resilient means, said housing having;

a front wall providing a fulcruming surface for said fulcruming means;

a rear wall engaged by said resilient means; and

two side walls disposed on opposite sides of said front wall and continuous with said rear wall;

said fulcruming means dimensioned to provide a ratio of fulcrum effect against vertical and lateral displacement of said first portion of said toe post member; and

said housing dimensioned so that the said side walls of the housing coact with the said surfaces of the fulcruming means to prevent rotation of the fulcruming means with relation to the said front wall of the housing.

3,870,327

SELF-RELEASING SKI-BINDING

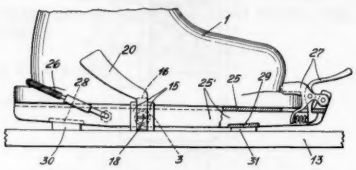
Alois Betschart, Jr., Algeristrasse, 6417 Sattel, Switzerland

Division of Ser. No. 195,136, Nov. 3, 1971, Pat. No. 3,779,570. This application Sept. 17, 1973, Ser. No. 397,517

Claims priority, application Switzerland, Aug. 11, 1971, 11783/71

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 K **9 Claims**



1. The combination comprising a ski, a base member for supporting a ski boot, means for securing a ski boot to said base member and a binding for connecting said base member to said ski, said binding comprising:

a. an elongated passage in said base member extending between opposite sides thereof,

b. a piston slidable in said passage,

c. stop means preventing said piston from sliding out one end of said passage,

d. a pin having a frusto-conical surface normally extending from said one end of said passage,

e. means adjustably mounting said pin on said piston such that the axial distance between said frusto-conical surface on said pin and said piston may be varied,

f. a plug removably secured in the end of said passage member opposite said one end, said plug having a frusto-conical surface extending radially from said opposite end of said passage,

g. a plurality of conical spring washers arranged within said passage and extending between said plug and said piston biasing said piston towards said stop means, and

h. fitting means arranged on said ski including a pair of spaced conical recesses therein for receiving said conical surfaces of said pin and plug,

i. whereby the axial distance between said frusto-conical surface of said pin and plug may be changed by adjusting said pin mounting means and the biasing pressure applied to said piston may be changed by removing said plug and rearranging said spring washers relative to each other.

3,870,328

PRACTICE WEIGHT FOR ICE SKATES

John F. Gemmel, 566 Wardlaw Ave., and Charles C. Brown, 46 Nichol Ave., both of Winnipeg, Manitoba, Canada

Filed Feb. 2, 1973, Ser. No. 329,035

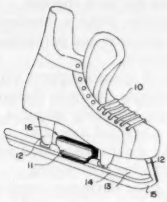
Claims priority, application Canada, Feb. 2, 1972, 133731

Int. Cl. A63c *3/00*

U.S. Cl. 280—11.37 E **4 Claims**

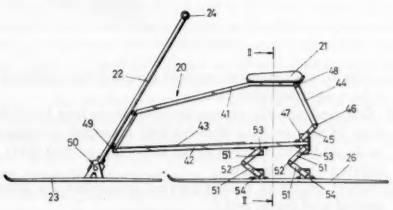
1. A practice weight for detachable securement to the central longitudinal tube of ice skates immediately above the skate blade holder comprising a pair of weight portions, means on said portions engaging around the central tube of the associated skate and means cooperating between said portions to detachably clamp same to said tube, each of said portions

being provided with an arcuately curved outer surface when viewed in end elevation, the ends of said portions being



rounded whereby said weight, when installed, presents a smoothly curved outer surface.

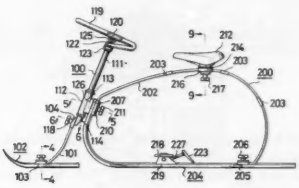
3,870,329
SKI-BOB
Jean-Yves Evequoz, 17, route de la Dixence, 1950 Sion, Switzerland
Filed Oct. 12, 1973, Ser. No. 405,849
Claims priority, application Switzerland, Oct. 14, 1972, 15053/72; July 31, 1973, 11111/73
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 **8 Claims**



1. In a ski-bob comprising a chassis, a steering column pivotally connected to the chassis about a first axis, a front ski connected to the steering column, and a pair of rear skis connected to the chassis by two independent suspension devices, the improvement wherein the chassis includes a first part to which the steering column is connected and a pair of independent elongate frame members each having a first end and a second end, said frame members being independently articulated about said first ends thereof to said first part for independent pivotal movement thereof in generally side-by-side spaced-apart relation about a second axis transverse to said first axis and transverse to the general longitudinal direction of said frame members, and wherein each of said suspension devices is independently connected to a respective one of said frame members towards the second end thereof.

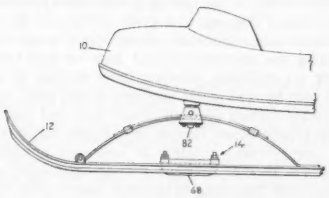
3,870,330
SNOW SCOOTERS
Fukuji Hatano, and Yukio Kobayashi, both of Tokyo, Japan, assignors to Gakken Co. Ltd., Tokyo, Japan
Filed Jan. 28, 1974, Ser. No. 437,466
Claims priority, application Japan, Mar. 5, 1973, 48-27396
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 **8 Claims**

1. A disassemblable snow scooter, comprising:
a steering part which consists of a front ski plate, a front fork separably connected in its lower part on said ski plate and separably connected in its upper part with the lower end of a handle shaft;
said handle shaft being separably connected in its upper part with a steering handle and a part rotatably holding said handle shaft;
a body which consists of a curved frame and rear ski plate and in which the rear part of said frame and the rear part of said rear ski plate are separably connected with each other;
the forward end part of said rear ski plate and forward end part of said frame are respectively bent and overlapped



on each other and are separably connected with said handle shaft holding part of said steering part;
a saddle part for the operator provided in the center of said frame; and
a foot resting part and braking parts to be pushed down with feet are provided on said rear ski plate.

3,870,331
SNOWMOBILE SKI ANTI-SKID ASSEMBLY
Gordon R. Cryderman, Skead, Ontario, Canada
Filed Jan. 29, 1974, Ser. No. 437,656
Claims priority, application Canada, Sept. 12, 1973, 181008
Int. Cl. B62b *17/02*
U.S. Cl. 280—28 **4 Claims**

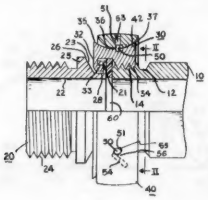


1. A snowmobile ski anti-skid assembly comprising:
a. a flat elongated blade; and
b. blade mounting means comprising an elongated blade quide adapted to be secured to the upper surface of the ski in alignment with a longitudinal slot in the ski, the blade guide defining an elongated vertical passage adapted to receive the blade, the vertical passage having a pair of vertically extending cylindrical portions connected by a straight narrow central portion; a pair of bolt members secured to the blade to extend vertically upwards therefrom; a pair of coil springs located respectively on the bolt members to continually bias the blade downward whereby a lower portion of the blade projects resiliently downward through the slot, the bolt members and corresponding springs being matingly received in the cylindrical portion of the vertical passage in the blade guide; a pair of stop means fixed to the blade guide in alignment with a respective one of the cylindrical portions of the vertical passage to limit upward movement of the upper end of the corresponding spring while allowing the upper end of the corresponding bolt member to project upwardly therebeyond; and a pair of nuts each threadably engaging the upper end of a respective one of the bolt member projecting beyond the stop means.

3,870,332
COUPLING IMPROVEMENTS

Edward M. Eaton, 1253 E. Adele St., Anaheim, Calif. 92805

Filed Sept. 18, 1973, Ser. No. 398,440
Int. Cl. F16l *37/10*
U.S. Cl. 285—35 9 Claims



1. A coupling for interconnecting a pair of tubular members and the like which comprises:

a. a body having a through opening and bearing attachment means at one end thereof permitting its removable, fixed attachment to one of said pair of tubular members and annular groove means at the opposite end thereof;

b. a plurality of closely spaced, segmented arcuate jaws carried at said opposite end, each jaw bearing an inboard radial flange cooperative with said annular groove of said body to provide a connection of said jaws on said body permitting the pivotal movement of said jaws in a radial direction between radially expanded and radially compressed positions;

c. tubular member engaging means carried on the outboard end of each of said jaws and mutually cooperative to engage the mating end of the other of said pair of tubular members when in the radially compressed position;

d. a curvilinear concave cam guide surface on the outside of each of said segmented, arcuate jaws; a cam ring surrounding the assembly of said jaws on said body and having a curvilinear, concave inner surface in engagement with the cam guide surfaces of said jaws; and

e. pin means carried on each of said jaws and cooperative helical groove means carried on engaging surfaces of said cam ring whereby rotation of said ring imparts axial movement thereto between a coupling closed position wherein said cam ring engages said jaws to urge said jaws into said radially compressed position and a coupling open position wherein said cam ring engages the inboard edges of said jaws to urge said jaws into said radially expanded position.

3,870,333
TRANSPORTATION CART

Steve Burdick, 15002 N. 32nd Dr., Phoenix, Ariz. 85023, and Roger Picard, 8401 N. 67th Ave., No. 81, Glendale, Ariz. 85302

Filed Sept. 17, 1973, Ser. No. 397,848
Int. Cl. B62b *3/00*
U.S. Cl. 280—47.35 3 Claims

1. A transportation cart for supporting articles at preselected heights in accordance with the heights of the shelves to which said articles are to be transferred and subsequently providing steps of consecutively ascending elevations as the lower said articles are sequentially removed therefrom, said transportation cart comprising:

a. a frame including a rectangular base and having a front end and a back end;

b. a plurality of horizontal platforms supported by said frame,

each said platform extending transversely across said frame, each subsequently rearward platform being spaced above the adjacent forward platform;

c. a handle extending rearward from the rearwardmost said platform;

d. a first pair of spaced support wheels depending from said base proximate the back thereof,

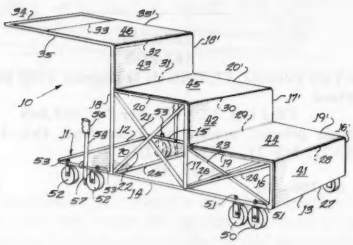
said wheels rotatable about a common axis which is horizontal in one direction and perpendicular to said frame in the other direction;

e. a second pair of spaced support wheels depending from said base proximate the front thereof,

said wheels being rotatable about a horizontal axis and pivotal about a vertical axis; and

f. selective brake means associated with each of said first pair of support wheels including

i. an elongate lever having an upper end and a lower end and pivotally connected to said base for rotation about a horizontal axis intermediate said upper end and said lower end,



ii. a flat arcuate member secured to said lever and having a face abutting said base,

iii. first and second spaced detents projecting from the face of said arcuate member and arranged to sequentially and operatively engage said base as said lever is rotated about its axis,

iv. wheel engaging means carried proximate the lower end of said lever, and

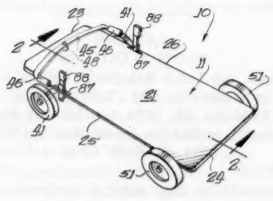
v. handle means proximate the upper end of said lever,

whereby movement of said handle in one direction urges said wheel engaging means against one of said first wheel and engages said first detent and movement of said lever in the opposite direction spaces said wheel engaging means from said wheel and engages said second detent.

3,870,334
SIDEWALK COASTER SLED

Kenneth E. Cole, 306 6th Pl., St. Elmo, Ill. 62458

Filed Nov. 5, 1973, Ser. No. 413,164
Int. Cl. B62b *11/00*
U.S. Cl. 280—87.01 4 Claims



1. A sidewalk coaster sled intended for rolling along a suitable supporting surface comprising a platform having a top surface, a bottom surface, opposed front and back edges, and opposed side edges, a front pair of wheels interconnected at their axis by an axle extending therebetween, means rotatably

mounting the axle to the platform beneath the bottom surface thereof in a manner permitting free rotative movement of the wheels in the general longitudinal direction of the platform, a handle bar disposed above the top surface of the platform near the front and edge thereof, means interconnecting the handle bar to the front wheel axle to effect the rotative movement of the axle between a front wheel normal straight-ahead position and angular positions relative thereto in a manner to effect the steering movement of the platform, a pair of laterally spaced apart back wheels, a back axle rotatably interconnecting the back wheels, means rotatably supporting the back axle beneath the platform bottom surface in a manner permitting free rotative movement of the back wheels in planes parallel to the longitudinal axis of the platform, each of the back wheels having an interior circular hub portion, a brake pad associated with each back wheel hub portion and adapted for movement into and out of engagement therewith, a brake pad rod interconnecting the brake pads and extending transversely of the platform, the brake pad rod being mounted for longitudinal movement forwardly and rearwardly of the platform, the rear most position of the brake pad rod defining the disengaged position between the brake pads and the wheel hub, forward longitudinal movement of the brake rod effecting the engagement of the brake pads with the wheel hub, spring means resiliently biasing the brake pad rod and connected brake pads in a manner to maintain the brake pads normally disengaged from the wheel hubs, said spring means normally biasing the brake pad rod in the rearmost position, a brake operating handle disposed forwardly of the platform and operatively connected to the brake pad rod to slectively effect movement thereof into a wheel hub engaging position to apply a braking force to the back wheels, the brake operating handle comprising a pair of laterally spaced apart and transversely aligned brake handles, each handle disposed adjacent an opposite side edge of the platform near the front end portion thereof, the brake handles each being identical and of an elongated configuration having their bottom ends projecting beneath the bottom surface of the platform and rigidly interconnected by a rod extending therebetween, the midportion of each brake handle being pivotally connected to the platform for swinging movement in a vertical plane about the horizontal axis of the pivot in a manner to effect the longitudinal forward and rearward movement of the handle rod, the top end of each handle member terminating in a hand grip portion adapted to be gripped in the hand of an individual to effect the movement of the associated handle member, and means interconnecting the handle rod with the brake rod for substantially equal and simultaneous movement in like directions by both rods whereby movement of the handle grip portions about their respective pivot points will effect forward movement of the handle rod which in turn will effect forward movement of the brake rod against the spring means to urge the brake pads into frictional engagement with the wheel hubs to apply a braking force thereto, the release of the brake handles permitting the springs to return the brake rod to the brake disengaging position rearwardly of the platform, such movement simultaneously returning the brake handles to their normal at rest positions.

3,870,335

STEERING ARRANGEMENT FOR MOTOR VEHICLES

Waldemar Schulz, Dannenbuettel, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

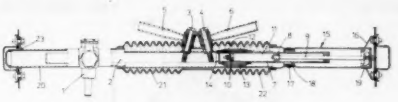
Filed July 5, 1973, Ser. No. 376,339

Claims priority, application Germany, July 25, 1972, 2236379

Int. Cl. B62d *3/00*

U.S. Cl. 280—90 **9 Claims**

1. In a motor vehicle, a fixedly supported steering gear coupled to a steering wheel, at least a pair of tie rods, each coupled to one of the vehicle wheels, a force translating member mounted shiftable transversely with respect to the longitudinal axis of the vehicle and coupled to said steering gear and operably coupled to said tie rods, a shock absorbing means mounted at one end of said force translating member coaxially therewith, said shock absorbing means comprising a pipe means and a piston means placed operably in said pipe means for moving telescopically therein, said pipe means of



said shock absorbing means being rigidly coupled to said one end of said force translating member, a fixed retaining means, said pipe means at least partially protruding into said fixed retaining means, said piston means for said shock absorbing means being fixedly coupled to the vehicle frame.

3,870,336

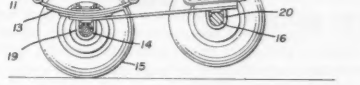
VEHICLE SUSPENSION

Michael Bilas, 2730 Columbiana-New Castle Rd., New Springfield, Ohio 44443

Continuation-in-part of Ser. No. 208,073, Dec. 15, 1971, Pat. No. 3,740,071. This application June 1, 1973, Ser. No. 366,136

Int. Cl. B60g *11/46*

U.S. Cl. 280—124 F **5 Claims**



1. A wheel suspension for a vehicle having a first wheel and axle assembly and first springs on said wheel and axle assembly arranged to pivotally engage said vehicle, said suspension including an auxiliary wheel and axle assembly, parallel elongated secondary springs having opposite end portions attached to said first wheel and axle assembly and to said auxiliary wheel and axle assembly, said parallel elongated secondary springs normally urging said auxiliary wheel and axle assembly toward said vehicle and air bags positioned between said auxiliary wheel and axle assembly and said vehicle acting when inflated to move said auxiliary wheel and axle assembly away from said vehicle and means for inflating and deflating said air bags.

3,870,337

CASING FOR TRACK-LAYING AND WHEEL-EQUIPPED VEHICLES

Martin Gilles, Cologne, and Anton Thiel, Garching/Alz, both of Germany, assignors to Clouth Gummisverke AG, Cologne, Germany

Division of Ser. No. 189,385, Oct. 14, 1974, Pat. No. 3,776,571. This application Aug. 21, 1973, Ser. No. 389,653

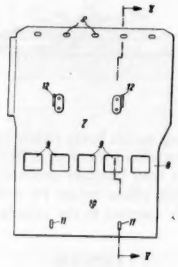
Claims priority, application Germany, Oct. 15, 1970, 2050492

Int. Cl. B62d *25/16*

U.S. Cl. 280—154.5 R **1 Claim**

1. A cover for use in combination with track-laying and wheel-equipped vehicles comprising a body portion which has a variable length and which is of an elastic material, and means forming a row of spaced windows therewith extending along the length of said cover to thereby weaken said cover so as to make it more readily foldable along the line of said windows in an articulation free of wear and tear as well as

being free of any maintenance requirements though said body portion at least in part is subject to folding upwardly and downwardly as a result of wind caused by travel, by objects thrown up and by positive folding, the lower portion of said cover being foldable upwardly onto the upper portion of said



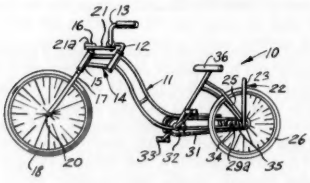
cover, one of said portions being provided with hook means and the other one of said portions being provided with eyes adapted selectively to engage said hook means to thereby hold the lower portions in upwardly folded condition onto said upper portions.

3,870,338

DUAL TRICYCLE KIT

Frank W. Holub, 1440 Columbus Ave., Burlingame, Calif. 94010

Filed Aug. 2, 1973, Ser. No. 385,061
Int. Cl. B62k *13/06*
U.S. Cl. 280—209 **1 Claim**



1. A dual tricycle kit for attaching a pair of standard bicycle frames in side-by-side relationship, each frame having a front portion, a rear portion and a drive chain, said kit comprising: a front assembly having (a) a wheel for supporting the front of the dual tricycle, (b) fork means rotatably carrying said wheel, (c) means for fastening said fork means midway between the front portion of each bicycle frame, (d) tie-rod means for connecting said fork with one bicycle frame for enabling steering of the dual tricycle; and

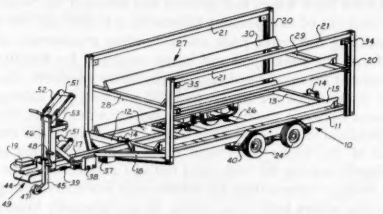
a rear assembly having (a) a shaft, said shaft being longer than the distance between the assembled bicycle frames, (b) two drive sprockets, one of said sprockets being mounted at an end of said shaft, the other of said sprockets being mounted on said shaft a distance equal to the spacing between the assembled bicycle frames from said end, (c) two wheels for supporting the rear of the dual tricycle, (d) rear frame means having (1) bar means, said bar means being longer than said shaft, (2) yoke means at each end of said bar means for rotatably carrying said wheels, (3) means for rotatably supporting said shaft such that the other end of said shaft is adjacent to one of said wheels, (4) means for rigidly attaching the rear portion of each bicycle frame to said bar means such that the drive chain of each bicycle frame can be connected to one of said drive sprockets, and (e) means connecting said other end of said shaft to said adjacent wheel for driving the wheel upon rotation of said shaft.

3,870,339

MULTI-PURPOSE TANDEM TRAILER

Jerry J. Goff, Fortville, Ind., assignor to Samuel Dowden, Ingalls, Ind., a part interest

Filed May 22, 1974, Ser. No. 472,119
Int. Cl. B60p *3/10*
U.S. Cl. 280—414 R **20 Claims**



1. A tandem multi-purpose trailer for transporting and storing at least two boats comprising:

a. a first support structure, said first support structure having means mounted thereon for carrying and securing a boat in a fixed position;

b. a second support structure, said second support structure being movable from a lower position immediately above said first support structure to a raised position of from about 3 inches to about 7 feet above said lower position, said second support structure having means for carrying and securing a boat in a fixed position;

c. a plurality of vertical guide members, said guide members having means for allowing said second support structure to move from said lower position to said raised position;

d. means for raising and lowering said second support structure along said guide members; and

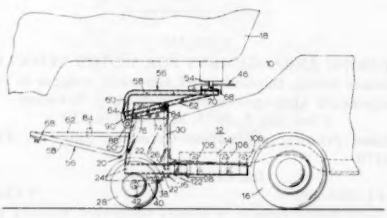
e. a tongue assembly, said tongue assembly connecting said first support structure to the vehicle pulling the trailer, said tongue assembly having mounted thereon means for fixedly attaching said trailer to said vehicle.

3,870,340

TOW HITCH FOR FIFTH WHEEL TYPE TRAILER

Charles M. Winter, 2580 W. Philadelphia St., York, Pa. 17404

Filed May 30, 1973, Ser. No. 365,288
Int. Cl. B62d *53/08*
U.S. Cl. 280—415 B **20 Claims**



1. A tow hitch mechanism for attaching a fifth wheel type trailer to the rear portionof the chassis of an automotive vehi-

cle comprising in combination, a hitch frame adapted to extend transversely to the longitudinal axis of such vehicle adjacent the rear end thereof, auxiliary wheels supported by the lower portion of said frame for engagement with a roadway, means upstanding from said hitch frame adjacent the rear end of said vehicle when said hitch frame is attached thereto, cantilever frame means supported by the upper end of said upstanding means and extending forwwardly therefrom relative to said vehicle, a fifth wheel hitch supported by said cantilever frame means at a height arranged to support the forward end of a fifth wheel type trailer at a lever in which the trailer is substantially level longitudinally when connected thereto, and coupling means includng interengageable members respectively connected to said hitch frame and interconnectable to the rear portion of the chassis frame members of such vehicle.

3,870,341

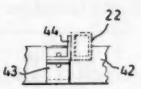
STRADDLE TRAILER HITCH

Dwen R. Younger, 2181 D Lone Oak Ave., Napa, Calif. 94558

Continuation of Ser. No. 392,612, Aug. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 237,471, March 23, 1972, abandoned. This application July 29, 1974, Ser. No. 492,570

Int. Cl. B62d *53/06*

U.S. Cl. 280—423 R **22 Claims**



1. A straddle trailer hitch assembly for connecting a trailer having forwardly directed elevated tongue with a tow vehicle of the type that includes a chassis having front and rear ends and front and rear ground wheels adjacent said front and rear ends and a body on said chassis, comprising:

a. a hitch element for releasable connection with said tongue;

b. a frame for supporting said hitch element on said chassis in a trailer towing position spaced above said body located centrally relative to the lateral sides of said body and at a point intermediate said front and rear ends;

c. securing means for releasably securing said frame to such chassis with said hitch element in said towing position;

d. said frame including a cross member of a length for extending transversely across the top of said body from side-to-side of the latter, with said hitch element rigid on said cross member centrally between the ends of the latter, and rigid members connected with said cross member extending downwardly therefrom having said securing means at the lower ends thereof when said hitch element is in said trailer towing position;

e. said rigid members comprising a pair of struts having forward end portions connected with the ends of said cross member, said struts extending longitudinally of said chassis and downwardly to the rear ends of the latter adjacent the rear end of said body when said hitch element is in said trailer towing position, and said rigid members including vertically extending legs connected with said struts adjacent their forward ends extending across opposite sides of said body to opposite sides of said chassis at their lower ends when said hitch element is in said trailer towing position.

3,870,342

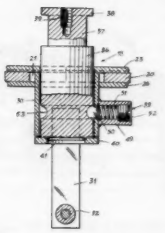
RETRACTABLE KING PIN AND CLAMPING ASSEMBLY

Bobby G. Baxter, and Theodore B. Splitt, both of Warrenton, Mo., assignors to The Binkley Company, Warrenton. Mo.

Filed Jan. 11, 1973, Ser. No. 322,640

Int. Cl. B62d *53/08*

U.S. Cl. 280—433 **13 Claims**



1. In a coupler for use with a towing vehicle and a trailer: a king pin assembly including a king pin holder adapted to be mounted on the bed of the towing vehicle and a king pin mounted therein for vertical movement from a retracted position to a position wherein it stands up from the bed of the vehicle a predetermined distance, and a coupler assembly engageable with the king pin in its upwardly extended position; the coupler assembly having a base and jaw means positioned above the base a distance to correspond to the elevation of the king pin, the king pin holder comprising a mounting plate adapted to overlie a part of the bed of the vehicle and a sleeve depending therefrom, the king pin being manually movable from a retracted position flush with the mounting plate to the projecting position, and spring detent means for releasably retaining the king pin in projecting position, said means comprising interengaging components on the king pin and sleeve that are disengaged when the king pin is retracted, so that it may remain in retracted position.

3,870,343

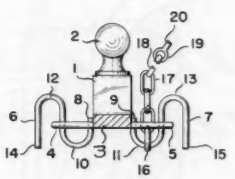
TRAILER HITCH AND SAFETY CONNECTOR

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed May 2, 1974, Ser. No. 466,344

Int. Cl. B60d *1/12*

U.S. Cl. 280—457 **9 Claims**

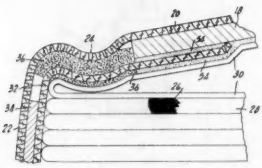


1. A trailer hitch and safety connector comprising a hitch tongue means for a connection between a towing and towed vehicle, a left and right horizontal ring portions connected to said hitch tongue means, a left and right vertical connector members affixed to said hitch tongue means, said left and right vertical connector members each including an inner lower loop and an outer upper loop, said vertical connector members being located about midway of said ring portions and cooperating therewith, and safety chains connected to the towed vehicle and removably connected to said left and right vertical connector members.

3,870,344
BOOK ARTICLE

William C. Heller, Jr., 1840 N. Farwell, Milwaukee, Wis. 53202, and Leonard Shatzkin, 132 Old Post Rd., North, Croton-On-Hudson, N.Y. 12534

Division of Ser. No. 74,271, Sept. 22, 1970, Pat. No. 3,730,806. This application Feb. 26, 1973, Ser. No. 335,556
Int. Cl. B42d 1/04; B42c 9/02
U.S. Cl. 281—21 4 Claims

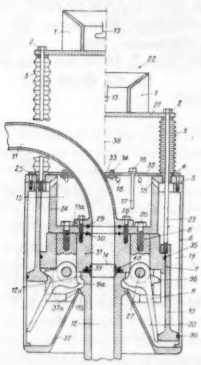


1. A bound book having a pair of covers separated by a spine and embracing a body of leaves bound along one edge, said body and covers having abuttable surfaces suitable for joinder at a hinge area of the book, said book having a composite hinge joint comprising abutting surfaces of the covers located adjacent the spine and abutting surfaces of said body of leaves adjacent said bound edge, said hinge joint having a first portion joined by conventional book binding paste and a second portion which is subjected to stress during use of the book, said second portion being joined by a solidified bonding agent comprised of a thermoplastic adhesive carrier containing dispersed particulate gamma Fe_2O_3.

3,870,345
TIGHT UNDERWATER CONNECTOR

Jean Alphonse Eugene Liautaud, Paris, France, assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Apr. 3, 1973, Ser. No. 347,526
Claims priority, application France, Apr. 7, 1972, 72.12239
Int. Cl. F16l 55/00
U.S. Cl. 285—24 15 Claims

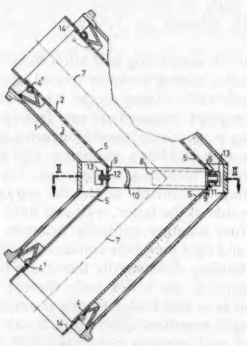


1. A connector for releasably connecting a first conduit to a second conduit on the bed of a body of water solely by an external force applied from the surface of the body of water by a single linear motion in the direction perpendicular to the open face of the second conduit, said connector comprising:
a. a connection seating adapted to be rigidly attached to a first conduit adjacent to the open face thereof and to extend radially therefrom;
b. a plurality of connecting rods slidably disposed in said connection seating for motion perpendicular to the open face of the first conduit when the connector is attached thereto;
c. a control plate to which each of said plurality of connecting rods is rigidly connected and which simultaneously operates said plurality of connecting rods; and
d. a plurality of locking levers pivotably mounted on said connecting seating, each of said plurality of locking levers:
i. being operatively connected to a related one of said plurality of connecting rods so that the linear motion of the related one of said plurality of connecting rods in the direction away from the open face of the first conduit when the connector is attached thereto and towards the open face of a second conduit to which the first conduit is to be attached will cause the locking lever to pivot about its axis from a first position to a second position and the linear motion of the related one of said plurality of connecting rods in the opposite direction will cause the locking lever to pivot about its axis from the second position to the first position and
ii. having a lug thereon positioned to releasably engage the second conduit when the connector is attached to the first conduit, the open face of the second conduit is positioned in face to face relationship with the open face of the first conduit, and the locking lever is in its second position,
whereby a first conduit to which the connector is attached may be releasably connected to a second conduit by first placing the open faces of the first and second conduits in face to face relationship and then forcing said plurality of connecting rods to slide in said connection seating in the direction perpendicular to the open face of the second conduit.

3,870,346
CONDUIT ELBOW

Peter Kappeler, and Klaus Uhlig, both of Zurich, Switzerland, assignors to Brown-Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,139
Claims priority, application Switzerland, Nov. 14, 1972, 16575/72
Int. Cl. F16l 59/14
U.S. Cl. 285—47 9 Claims



1. An elbow section for an insulated conduit for a high pressure, high temperature medium which flows at high speed, the conduit including coaxial external and internal pipes spaced from each other by an intermediate layer of insulating material and the internal pipe containing apertures for equalizing the pressures acting on its inside and outside surfaces and

thereby relieving it from pressure loading, the conduit having a longitudinal axis which changes direction in a bend plane in the region of the elbow section, and characterized by a support strip which is secured to the external pipe and is looped about a portion of the internal pipe so that it accepts and transmits to the external pipe the forces of the flowing medium which act radially outward on the internal pipe in the bend plane as a result of said direction change; and by guide means centered in the bend plane, reacting between the two pipes, and serving to allow movement of said portion of the internal pipe relatively to the external pipe only in the radial direction in the bend plane.

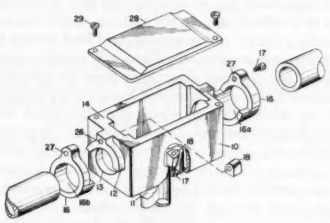
3,870,347
COUPLING SYSTEM RELATING ESPECIALLY TO CONDUIT FITTINGS, ELECTRICAL BOXES OR SPECIAL FITTINGS FOR OTHER APPLICATIONS

Kenneth C. Haubenestel, 2633 Grant Ave., Dayton, Ohio 45406

Continuation of Ser. No. 139,687, May 3, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,064

Int. Cl. F16l *41/00*

U.S. Cl. 285—156 **9 Claims**



1. Conduit fitting for connection to tubular elements such as pipes and conduits comprising

a housing having walls defining

an aperture in at least one wall of the housing and also defining

a guide way extending along the axis of said aperture and extending axially outwardly from at least one wall and having a surface angularly disposed relative to said axis and diverging therefrom in a direction from the exterior toward the interior of said housing,

a first arcuate portion terminating with outer ends which lie in a plane generally parallel to the axis of said aperture, said first arcuate portion connected to said guide ring and said one wall and extending axially outwardly from said one wall and coaxial with said aperture,

a clamp member having a hole therethrough registering with said aperture and having an arcuate end portion terminating with outer ends bearing against the outer ends of said first portion and having a second arcuate portion axially spaced from said end portion coaxial with said hole,

means releasably connecting said clamp member to said housing against relative movement thereto thereby providing lateral support for said tubular element when said element is disposed in said aperture including

a nut mounted for reciprocation in said guide way with opposite faces of said nut in engagement with said angularly disposed surface and with said tubular elements respectively, and

a screw threadedly engaging said nut and extending through said housing and said clamp member.

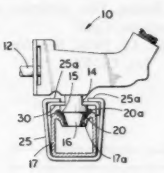
3,870,348
DUAL SEALING JUNCTION FOR GAS VALVE AND MANIFOLD

Samuel D. Hawkins, 21 E. Mulberry St., Lebanon, Ohio 45036

Continuation-in-part of Ser. No. 343,116, March 20, 1973, abandoned. This application Nov. 19, 1973, Ser. No. 417,107

Int. Cl. F16l *41/00*

U.S. Cl. 285—197 **5 Claims**



1. In combination, a gas valve having an extending inlet tube and a gas manifold pipe adapted to supply gas to the valve, an aperture in the wall of said manifold pipe with a portion of pipe wall bordering said aperture being turned inwardly to form a frusto-conical surface extending within the manifold pipe, the inlet tube of said valve having the outer surface of its tip formed in a frusto-conical surface matching that of said pipe wall and having an annular radially outwardly extending shoulder defining the wider end margin of said frusto-conical surface, a deformable member having a conical configuration and an outwardly flanged margin, said deformable member being interposed between said pipe wall and inlet tube frusto-conical surfaces with said flanged margin adjacent said annular shoulder, and releasable clamp means cooperating with said valve inlet tube and said manifold pipe for drawing said two frusto-conical surfaces into sealing relation with said deformable member and drawing said annular shoulder into sealing engagement with said flanged margin of the deformable member.

3,870,349
CONNECTING DEVICE BETWEEN A PIPE STUB AND A FLEXIBLE HOSE SURROUNDING THE STUB

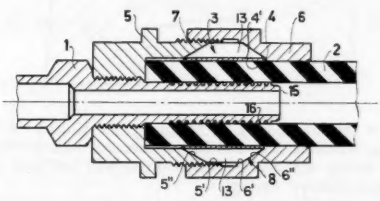
Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

Filed Aug. 13, 1973, Ser. No. 387,640

Claims priority, application Switzerland, Aug. 14, 1972, 11993/72

Int. Cl. F16l *33/00*

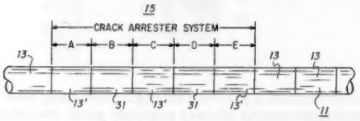
U.S. Cl. 285—249 **17 Claims**



1. A connecting device between a pipe stub and a flexible hose surrounding said stub, comprising a substantially axially symmetrical clamping means surrounding said hose and two clamping collar means which are arranged axially at each end of said clamping means and which are adapted to be axially tightened with each other, said clamping collar means having axial portions of substantially hollow cylindrical form which face one another, characterized in that the clamping means consists of a deformable, yet substantially non-compressible material, and in that the outer surface of the clamping means is provided with groove means that extend at least approxi-

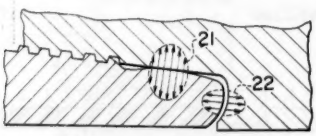
mately parallel to the axis and have a depth smaller than the radial thickness of the clamping means within the areas thereof devoid of groove means so that a continuous internal surface is provided by the clamping means which is uninterrupted.

3,870,350
CRACK ARRESTER SYSTEM
Rado G. Loncaric, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Apr. 15, 1974, Ser. No. 461,018
Int. Cl. F16l *13/02*
U.S. Cl. 285—286 **29 Claims**



1. In a pipeline formed from a plurality of sections of pipe, at least one crack arrester system in said pipeline at at least one intermediate point between the ends of said pipeline, said crack arrester system being in open communication with sections of said pipeline and being comprised of at least three zones along the longitudinal axis of said pipeline, two of said zones being at the two ends of said crack arrester system and being joined to sections of said pipeline on either end of said crack arrester system, and at least one of said zones being between said two end zones and having a resistance to crack propagation lower than said two end zones and lower than said sections of said pipeline on either side of said crack arrester system.

3,870,351
THREADED TUBE JOINT STRUCTURE FOR CASING, PARTICULARLY OIL WELL TUBING
Norio Matsuki, Osaka, Japan, assignor to Sumitomo Metal Industries Limited, Osaka, Japan
Filed Mar. 30, 1973, Ser. No. 346,302
Claims priority, application Japan, Mar. 31, 1972, 47/32953
Int. Cl. E21b *17/08;* **F16l** *15/00*
U.S. Cl. 285—334 **7 Claims**

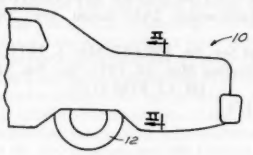


1. A threaded tube joint for casing, particularly oil well tubing, including male and female threaded tube members, each having a substantially cylindrical wall and said joint having a structure having:

a first metal-to-metal contact seal formed upon make-up of the joint between an outer surface of a thread-free end portion of the male threaded tube member having a longitudinally extending reference axis within its wall and a corresponding inner surface of the female threaded tube member having a longitudinally extending reference axis within its wall, said outer surface of the male member having a substantially spherical profile, said inner surface of the female member having a straight profile; and

a second metal-to-metal contact seal formed also upon make-up of the joint between the end face of the wall of said end portion of the male member and a corresponding face of the wall of the female member, one of said faces of the male and female members substantially having with respect to its reference axis a profile of a convex surface of revolution for aligning the reference axis of the male member with the reference axis of the female member, and the other of said faces of the male and female members substantially having with respect to its reference axis a profile of a concave surface of revolution so as to be complementary to that of the one face.

3,870,352
TRACK GRIT SPREADER APPARATUS
John R. Engler, 4842 Crescent Ave., and Ronald F. Dompke, 4223 Ottawa Ave., both of Norridge, Ill. 60634
Filed July 2, 1973, Ser. No. 375,768
Int. Cl. B60b *36/06;* **B61c** *15/10;* **B61h** *11/00*
U.S. Cl. 291—15 **13 Claims**



1. In apparatus for increasing traction between the drive wheels of a vehicle and an icy surface, supply means adapted to contain a supply of coarse salt, and feed means for feeding said coarse salt downwardly from said supply means to drop on icy surface portions directly in front of said drive wheels, said vehicle being an automoble having a trunk space defined in part by wheel well members over said drive wheels, said wheel well members including wall portions in generally vertical planes spaced inwardly from the vertical planes of the inside surfaces of said drive wheels to define clearance spaces, said wall portions having openings located approximately in a vertical plane through the drive wheel axis and in spaced relation above said axis, said supply means being disposed in said trunk space and said feed means defining passages for flow of salt from said supply means through said openings and thence downwardly, forwardly and outwardly to drop in front of said drive wheels, said feed means comprising a pair of substantially straight chute means defining portions of said passages and mounted against said wall portions in said clearance spaces, said chute means having upper ends for receiving salt flowing out through said openings in said wall portions and being inclined downwardly and forwardly to lower open ends approximately in horizontal alignment with said drive wheel axis and approximately in a vertical plane ahead of the forward circumferential portions of said drive wheels, the cross-sectional size of said chute means being large enough for free flow of coarse salt fed into said upper ends of said chute means to be propelled by gravity and to be directed forwardly from the said lower open ends of said chute means.

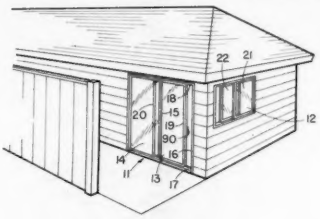
3,870,353
LATCHES
Wesley E. Miller, 13641 Milton Ave., Westminster, Calif. 92683
Continuation-in-part of Ser. No. 193,725, Oct. 29, 1971, abandoned. This application May 21, 1973, Ser. No. 362,602
Int. Cl. E05c *1/12*
U.S. Cl. 292—37 **6 Claims**

1. For a sliding panel installation in which a door or window opening adjacent to a fixed wall or window panel is opened and closed by a sliding panel mounted for sliding movement in upper and lower tracks that extend alongside said fixed panel and across the opening, in combination:

a panel capable of being mounted in said tracks for movement between an open position in which it is disposed next to said fixed panel and a closed position in which it

covers said opening and which has a rear portion disposed next to said fixed panel; and

a latching structure carried by one of said panels and including a bolt and means for actuating said bolt to and from a keeper opening on the other of said panels, said means for actuating said bolt comprising biasing means for biasing said bolt to extended position and retraction means



responsive to forces applied remotely for retracting the bolt against said bias;

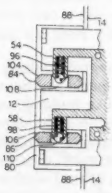
said means for actuating said bolt further comprising a cam in the fomr of a slotted member movable from one position to another and a cam follower fixed to said bolt and positioned in the slot of said slotted member, said bias spring being mounted to move the cam follower toward a position in which said bolt is extended.

3,870,354

DROP BOLT SNAP LATCH LOCKING MECHANISM

Herman Prahl, 48-38 Fifty Eight Ln., Woodside, N.Y. 11377

Filed June 18, 1973, Ser. No. 371,141
Int. Cl. E05b *63/12, 15/10*
U.S. Cl. 292—116 **4 Claims**



1. A drop bolt locking mechanism and strike member combination capable of snap latch operation comprising:

a bolt element housing for mounting upon a door with a portion of said housing extending beyond the edge of said door, said portion consisting of a plurality of sections with spaces between said sections extending in a direction substantially perpendicular to said edge of said door;

a bolt element mounted within said housing for movement therein relative to said housing in a direction substantially parallel to said edge of said door, said bolt element having finger means thereon for movement in said spaces in a direction parallel to said edge of said door;

means in said housing for resiliently biasing said bolt element in a first direction parallel to said edge of said door for normally maintaining said finger means in said spaces;

a strike member for mounting on the door frame opposite said housing, said strike member having a plurality of projecting flange means for mating with said spaces and said flanges having apertures therein for receipt of said finger means;

said flange means having bevelled edges for engaging said finger means and pushing said bolt element in a second direction opposite to said first direction upon closing of said door to enable said snap latch operation; and

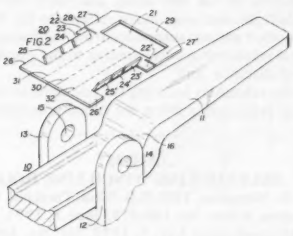
said finger means having ball bearings projecting therefrom into said spaces to facilitate said snap latch operation.

3,870,355

DETERRENT SPRING CLIP

Charles T. Biscardi, Maple Shade, N.J., assignor to Merit Metal Products Corp., Warrington, Pa.

Filed Feb. 15, 1973, Ser. No. 332,619
Int. Cl. E05c *19/18*
U.S. Cl. 292—307 R **7 Claims**



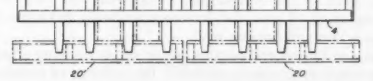
1. A clamping plate to be nestingly secured between two projecting members of predetermined length and breadth which are separated by a predetermined dimension, comprising: a flat sheet of rigid material having a width exceeding said predetermined dimension; a pair of slits on opposing edges of said flat sheet; each pair of slits defining a central ear having a length substantially conformed to the length of one of said projecting members, a first end ear extending past one side of said one projecting member, and a second ear extending past the other side of said one projecting member, the width of said sheet between the slits on the opposing edges, being slightly less than said predetermined distance between said projecting members; said central ears projecting substantially outward from the sides of said flat sheet, being inherently biased by the characteristic of said sheet to retain this orientation, and having transverse slots substantially orthogonal to the opposed faces of said projecting members when said plate is secured thereto; said end ears being deformed in a direction opposite to the projection of said projecting members along bend lines on opposing edges of said sheet which are separated by slightly more than said predetermined distance between said projecting members.

3,870,356

ADJUSTABLE MATERIAL HANDLING FORK

Charles D. Meads, Hellam, Pa., assignor to DICO Company, Inc., York, Pa.

Filed Nov. 7, 1973, Ser. No. 413,701
Int. Cl. B66c *1/22*
U.S. Cl. 294—67 A **7 Claims**



1. An expandable fork for transferring a plurality of objects from a location in which they are a lesser predetermined distance apart to a location in which they are a greater predetermined distance apart, which fork comprises:

a suspendable frame;

first and second tine units, each of said units including a plurality of horizontal tines capable of supporting a load; a plurality of support members, at least one of which members pivotally secures each tine unit to the frame such that, when the fork rests upon a surface, the tine units are in a proximate lateral relationship corresponding to the lesser predetermined distance and the frame is supported by the tine units, and when the fork is suspended, the tine units move relative to the frame and to each other and are suspended from the frame in a remote lateral relationship corresonding to the greater predetermined distance; and

means for releasably securing the tine units in the proximate lateral relationship when the frame is suspended.

3,870,357

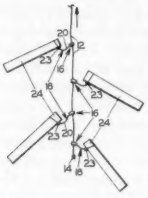
SELF-LOCKING WINCH LINE HOOK

Kenneth L. Wernsing, 1931 N.E. 72nd, Portland, Oreg. 97212

Continuation of Ser. No. 148,379, June 1, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,019

Int. Cl. B66c *1/12*; F16g *11/14*

U.S. Cl. 294—74 **1 Claim**



1. In combination with a winch line and a ferruled choker line in log skidding and like operations, a winch line hook comprising:

a. an annular body defining a single laterally elongated, unobstructed opening longitudinally therethrough,

b. one lateral end portion of the opening defining a winch line guide sleeve slidably receiving the winch line and having a lateral dimension larger than the cross sectional dimension of the choker line ferrule and also larger than the combined diameters of the winch line and choker line,

c. the opposite lateral end portion of the opening defining a ferrule pocket dimensioned to seat the choker line ferrule with the outer end of the ferrule facing the winch line in the sleeve,

d. the longitudinal axis of the ferrule pocket being disposed at an angle of about 20°–60° to the longitudinal axis of the sleeve opening,

e. the ferrule pocket being defined by a pair of side walls, a bottom wall and a front wall extending from the bottom wall and terminating adjacent the sleeve opening a distance from the winch line less than the length and the diameter of the ferrule, whereby the winch line obstructs movement of the seated ferrule inwardly of the front wall,

f. the front and bottom walls of the ferrule pocket having a continuous central slot having a width greater than the diameter of the winch line and the choker line but less than the diameter of the choker line ferrule,

g. the back of the ferrule pocket opposite the front wall being open to pass the ferrule rearwardly between the winch line and bottom wall,

h. said one lateral end portion of the single opening affording common access by and free interchange of positions of both lines, whereby the choker line is movable into the winch line guide opening and the winch line is movable into the ferrule pocket opening for removal and installation of the ferruled choker line through the winch line guide opening.

3,870,358

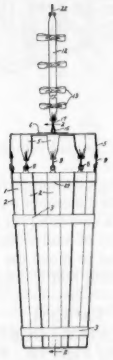
APPARATUS FOR MANUALLY RAISING AND LOWERING BULKY PACKAGES

Julia A. S. Bennett, 315 Wall St., Apt. No. 3, Jeffersonville, Ind. 47130

Filed Dec. 26, 1973, Ser. No. 428,188

Int. Cl. B66c *1/12*

U.S. Cl. 294—77 **2 Claims**



1. An apparatus for manually raising and lowering bulky or otherwise burdensome packages between the floors of an apartment, dwelling or like building, comprising:

A. a bag having a mouth at its upper end and a capacity large enough to receive a manually-handable package;

B. a lid removably securable over the mouth of the bag,

1. said lid having a central section and a series of straps secured to said section and arranged to extend from the periphery of said section for bag supporting purposes and terminating in free ends, which are detachably securable to the mouth end portion of said bag,

a. said central section being relatively stiff in comparison to said straps;

C. an elongate cable having a lid end;

D. means for securing said cable to said lid with the lid end of the cable located over said central section of the lid; and

E. handgrips mounted on the cable along its length to facilitate the raising and lowering of the bag in step-by-step fashion when the bag, lid and cable are secured together.

3,870,359

CLAMP CONSTRUCTION

John V. Hultquist, 836 Hayward St., Anaheim, Calif. 92804

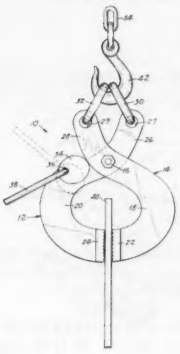
Filed Aug. 8, 1973, Ser. No. 386,833

Int. Cl. B66c *1/48*

U.S. Cl. 294—118 **7 Claims**

1. A C-clamp comprising a pair of clamping members pivotally attached to one another intermediate their ends, the portions of said members to one side of the pivotal attachment comprising generally C-shaped arms terminating in facing clamping jaws, the portions of said members to the other side of the pivotal attachment comprising handle elements, cam

means movably carried by the arm of one of said members for engagement with the handle element of the other of said



members to hold the clamping jaws in clamped position upon clamping a workpiece therebetween.

3,870,360

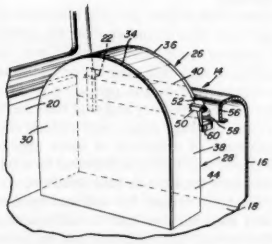
PICKUP TRUCK SPARE TIRE MOUNT AND COVER

William W. Nichols, 4218 Delwood, Odessa, Tex. 79760

Filed Sept. 21, 1973, Ser. No. 399,615

Int. Cl. B60r *7/00*

U.S. Cl. 296—37 A **9 Claims**



1. In combination with a pickup truck load bed of the type including a floor and a side wall projecting upwardly from said floor provided with an upwardly opening socket of appreciable vertical extent in the upper marginal edge portion of said side wall, a hollow vertically elongated downwardly opening upstanding housing disposed immediately inwardly of and extending along the inner side of said side wall and directly removably supported on said floor with one side of said housing adjacent and opposing said inner side of said side wall, said housing being of a height and width to be downwardly telescoped over an upstanding pickup truck spare tire and wheel supported on said floor in upright position immediately inwardly of said side wall, said housing including an upper portion projecting above said side wall, said upper portion of said housing including a depending stake supported from the housing and removably downwardly telescoped in said socket.

3,870,361

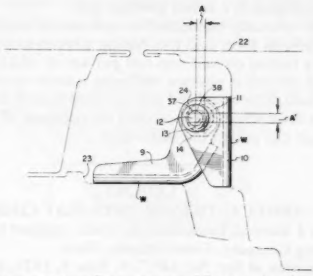
HINGING SYSTEM FOR AUTOMOBILE DOORS WITH HINGE HALVES WELDED TO BODY AND DOOR

Herbert Krause, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Feb. 12, 1973, Ser. No. 331,817

Int. Cl. E05d *7/04*

U.S. Cl. 296—146 **13 Claims**



1. In a hinging system for an automobile door in which there are hinge members on the door and body that are permanently and nonadjustably fixed to said door and body, respectively, and in which said hinge members are adapted to be pivotally connected together by a pintle, the pintle being pivotally received in aligned holes in knuckles on one of said hinge members, the improvement which consists of a bushing having a hole provided therein longitudinally thereof in which the pintle is received with a rotatable fit, the bushing being rotatably adjustable in a hole provided in the other of said hinge members, the axis of the hole in said bushing being eccentrically positioned with respect to the axis of said bushing, said bushing having a polygonal portion on which a wrench may be engaged for rotary adjustment of the bushing, said bushing being of a length to reach from the inner side of one outer hinge knuckle to the inner side of the other outer hinge knuckle, said pintle having a head on one end abutting the outer side of one knuckle of the outer hinge member and a threaded portion on the other end projecting from the outer side of the other knuckle of the outer hinge member, and a jam nut threaded on the projecting threaded end of said pintle and tightenable so as to clamp the bushing endwise between said knuckles in its rotatably adjusted position.

3,870,362

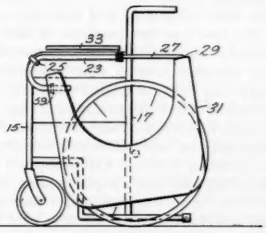
TRAY ATTACHMENT FOR WHEELCHAIRS

Richard L. Large, Lincoln, Nebr., assignor to RVL Industries, Inc., Lincoln, Nebr.

Filed Aug. 29, 1973, Ser. No. 392,812

Int. Cl. A47c *39/00*

U.S. Cl. 297—155 **5 Claims**



1. A wheelchair tray which is attached to the arm rest member of a wheelchair, said wheelchair including a pair of side frame members, each including an arm rest portion and drive

wheels rotatably attached thereto, the wheelchair tray improvement comprising in combination:

a mounting tube rigidly but removably connected to one of said side frames, said tube being substantially horizontal and having an open end toward the rear of said wheelchair,

an extension tube slidably and rotatably positioned in said mounting tube through said open end for telescopic movement with respect thereto, said extension tube being terminated in a swivel portion, and

a tray rotatably connected to said swivel portion of said extension tube, said tray having a recessed portion, said tray resting on said arm rest portion of said frame when in a utilization position and being rotated against the side of said drive wheel and slid rearward to such position that the drive wheel is exposed so the occupant of the wheelchair can propel the wheelchair.

3,870,363

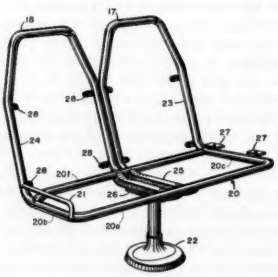
SEMI-CANTILEVER TWIN-SEAT CHAIR

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Continuation of Ser. No. 149,729, June 3, 1971, abandoned. This application May 4, 1973, Ser. No. 357,397

Int. Cl. A47c *3/00*

U.S. Cl. 297—232 **6 Claims**



1. A semi-cantilever multiple passenger transit chair comprising: a tubular frame including a one-piece tubular member forming a front stretcher tube, aisle and wall side frame members extending rearwardly of said front stretcher tube at the ends thereof, said tube being thence formed upwardly from the rear of said aisle and wall side farme members respectively and thence toward the longitudinal center of said chair and thence downwardly to provide separate back cushion support frames, said frame further including a rear stretcher tube generally parallel to said front stretcher tube and extending between the rear portions of said aisle and wall side frame members, the lower center portions of said back cushion support frames being connected to the approximate midpoint of said rear stretcher tube; a rigid reinforcing cross beam structure including first and second tubular cross beam members connected at their forward and rear ends respectively to the approximate midpoints of said forward and rear stretcher tubes; a single pedestal located beneath said cross beam structure and cooperating with said wall to support said chair, said pedestal including only one upright column attached to said reinforcing cross beam structure and a base mounted to the floor of said vehicle; means for securing said wall side frame member to an upright wall of a vehicle; and cushion means on said frame providing seats and backs for two passengers side by side, said cushion means providing said backs each including rigid back panel means rigidly secured to an associated back cushion support frame.

3,870,364

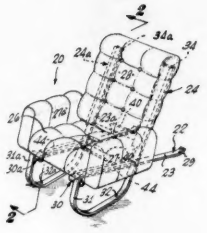
RECLINABLE CHAIRS AND SEATS

Ignacio Cortina O., Paseo de Las Palmas 765, Mexico 10, D.F., Mexico

Continuation-in-part of Ser. No. 229,447, Feb. 25, 1972, abandoned. This application Feb. 26, 1973, Ser. No. 335,788

Int. Cl. A47c *3/00*

U.S. Cl. 297—294 **22 Claims**



1. A reclining structure for a chair or the like, which includes:

a base member having a frontal end and a rear end, a substantial portion of said base member being elongated and adapted to contact with the floor;

a backrest member fixedly mounted to the rear of said base member and curved upwardly and rearwardly therefrom, the radius of curvature, and angle, between said base member and said backrest member being such as to allow a smooth pivoting action about the juncture of said base and backrest member to occur;

a seat member;

hinge connection means provided between said seat member and said base member near the frontal end of said base member, said seat member not being otherwise connected to said base member or backrest member, said hinge connection means providing a pivotal axis about which said seat member and said base member can rotate with respect to each other, and without restriction, under the influence of moments of force applied to said seat member and said backrest member by a person in moving to a reclining position in said structure;

rear floor support means, for said seat member, mounted to said seat member, but not to said backrest member, to permit rearward movement of said backrest member; and means for limiting the rearward movement of said backrest member prior to reaching a point of instability of the structure.

3,870,365

CHAIR OR ANALOGOUS ARTICLE OF FURNITURE

Odd Knutsen, N-7208 Mageroy, Norway

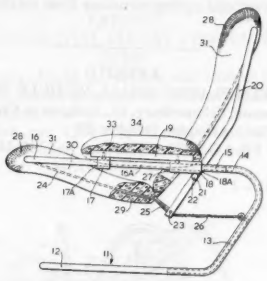
Filed Nov. 20, 1973, Ser. No. 401,445

Int. Cl. A47c *1/032, 7/54*

U.S. Cl. 297—320 **15 Claims**

1. In a chair or an analogous article of furniture, having a back structure and a seat structure which are hinged together to allow for an adjustment of the inclination of the back structure, and wherein the back structure is connected with slides which are carried by a substantially horizontal guide member on each side of the chair, the improvement comprising a supporting structure for maintaining stationary said seat struc-

ture at its front end and means for effecting a substantially vertical movement of the line of connection between the back

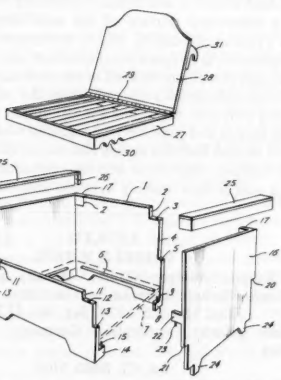


structure and the seat structure when the inclination of the back structure is adjusted.

3,870,366
KNOCKDOWN FURNITURE

Lucious E. Rogers, 1011 W. Fugate, Houston, Tex. 77009

Filed July 9, 1973, Ser. No. 377,742
Int. Cl. A47c *4/02, 7/20*
U.S. Cl. 297—440 **5 Claims**



1. In knockdown furniture, a front and a back member formed with marginal shoulders having pin receiving holes and inwardly extending members having upwardly extending pins, and having side members with matching load bearing shoulders and pins and pinholes adapted to join the front and back members, and channeled members adapted to be loosely mounted on the upper margin of the side members and engaging the rear member, and a seat member mounted on said front and back members, said seat member being comprised of two hinged sections, notches on one section to be selectively engaged with the upper margin of the front member and a hanger on the other section adapted to engage the upper margin of the back member.

3,870,367
WHEELBARROW LIKE VEHICLE FOR TRANSPORTING BULKY MATERIAL SUCH AS LEAVES, TRASH OR THE LIKE

John A. O'Brien, 35 Longview Rd., Reading, Mass. 01867

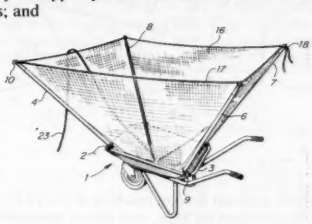
Filed May 21, 1973, Ser. No. 362,543
Int. Cl. B60p *1/64*
U.S. Cl. 298—1 B **4 Claims**

1. A vehicle particularly well adapted for transporting bulky items comprising:

a. a wheelbarrow having sloping side walls;

b. a superstructure positioned above said wheelbarrow and including a plurality of widely diverging elongated support members wherein lower portions of said elongated support members are affixed to the sloping walls of said wheelbarrow so that the longitudinal axis of said elongated support members are substantially parallel with said walls to thereby provide for the widely diverging orientation of said elongated support members;

c. a net capable of being turned inside out, coupled to said superstructure, said net having a greater volumetric capacity at upper portions thereof relative to lower portions; and

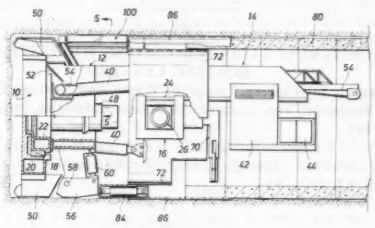


d. an elongated pulling member coupled to said net for enabling said net to be readily turned inside out by pulling on said pulling member in spite of the presence of said bulky items therein.

3,870,368
TUNNELING SHIELD

Douglas F. Winberg, Issaquah, Wash., and Norman D. Dyer, Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 23, 1973, Ser. No. 363,035
Int. Cl. E01g *3/04*
U.S. Cl. 299—31 **12 Claims**



1. A machine for boring a tunnel in a subterranean formation comprising:

a. a main beam assembly for longitudinal disposition within said tunnel;

b. cutterhead support assembly connected to said main beam assembly;

c. a cutterhead assembly rotatably mounted on said cutterhead support assembly;

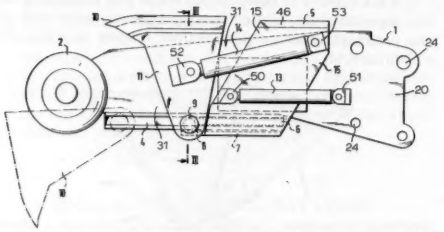
d. a gripper assembly slidably connected to said main beam assembly and engageable with the walls of said tunnel for advancing said main beam, cutterhead support and cutterhead assemblies longitudinally through said tunnel; and

e. extendable and retractable shield means connected to said cutterhead support and gripper assemblies for shielding the area of said tunnel between said cutterhead support and gripper assemblies regardless of the relative longitudinal distance therebetween, said shield means comprising flexible joint means at each end thereof connecting said shield means to said cutterhead support and gripper assemblies.

3,870,369
DEVICE FOR USE WITH TUNNEL DRIVING MACHINES

Armin Lobbe, Bergk-Oberaden, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Nov. 15, 1973, Ser. No. 416,333
Claims priority, application Germany, Nov. 15, 1972, 2256020
Int. Cl. E21c 25/52, 27/30
U.S. Cl. 299—71 24 Claims

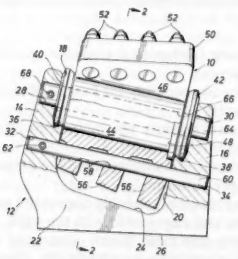


1. In or for a tunnel driving machine a device for detaching material from a working face, said device comprising:
   a. a generally elongate body arranged for attachment at one end to said machine;
   b. a first material cutting means disposed at the opposite end of said body;
   c. a carriage;
   d. means for guiding the carriage for movement along said elongate body;
   e. a second selectively-operable material cutting means in the form of a tool;
   f. side members supporting said tool and projecting on opposite sides of said elongate body; and
   g. journals on said carriage for pivotally supporting said side members;
   h. whereby material can be detached from said working face by said first cutting means or by said first and second cutting means working simultaneously.

3,870,370
UNIVERSAL SADDLE MOUNTING FOR FIXED AND ROLLING CUTTERS

Douglas F. Winberg, Issaquah, Wash., and Norman D. Dyer, Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 23, 1973, Ser. No. 353,539
Int. Cl. E21b 9/08; E01g 3/04
U.S. Cl. 299—91 24 Claims

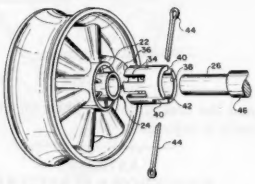


1. A rolling cutter assembly support and fixed cutter assembly combination comprising: a rolling cutter assembly support having a base portion adapted to be secured to a bit body, holding means on said support spaced from said base portion engageable with a non-rotating part of a rolling cutter assembly to rotatably support a cutting element of said rolling cutter assembly; and a non-rotating cutter assembly having a mounting part compatible with and mounted on said holding means and also having a cutting structure projecting from said holding means in a direction away from said base portion; a fixed surface on said cutter support and a fixing surface on said non-rotating cutter assembly engageable with said fixed surface to prevent said cutting structure from rotating relative to said support.

3,870,371
DRIVEN PLASTIC SMALL VEHICLE WHEEL

Milton Solomon, Schaumburg, Ill., assignor to Circle Engineering Co., Inc., Arlington Heights, Ill.

Filed Oct. 25, 1972, Ser. No. 300,468
Int. Cl. B60b 37/04
U.S. Cl. 301—1 23 Claims

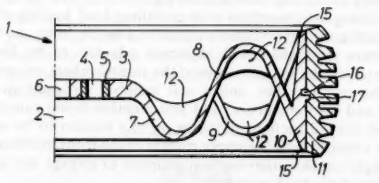


1. A vehicle wheel for mounting to a cylindrical shaft and driven thereby, said wheel comprising a rim, a cylindrical hub, connecting structure joining the rim to the hub, the hub having a cylindrical bore and radially extending rib means formed along a substantial portion of the axial length of the hub, hollow cylindrical bushing means constructed and arranged for securement in coupled condition with said hub and having first through slot means formed in one end face of said bushing means circumferentially spaced about the said end face and extending only part way along the circumferential wall of said bushing means and positively engageable with said rib means received in said first slot means and means coupling said shaft to said bushing whereby a driving connection is established through said hollow bushing between said wheel and shaft.

3,870,372
VEHICLE WHEEL

Ulrich Knipp, Schildgen-Nittum, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1974, Ser. No. 472,009
Claims priority, application Germany, June 6, 1973, 2328794
Int. Cl. B60b 5/00
U.S. Cl. 301—63 PW 13 Claims



1. A plastic vehicle wheel comprising a dish, means for securing the dish to a hub, a concentric rim carried on the peripheral edge of the dish, webs leading from the dish to the rim, a tread secured to the rim ,said dish having a centrally disposed base, and between the base and rim, an intermediate web portion in the form of half a sinusoidal wave integral with the base and integral with a number of circumferentially spaced webs curved into the form of at least half a sinusoidal wave, said intermediate portion being integral with oppositely curved webs in the shape of at least half a sinusoidal wave,

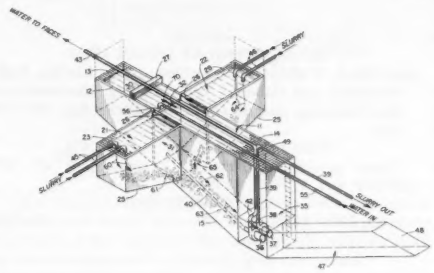
disposed in the spaces between the first said webs, both webs terminating in the rim.

3,870,373

UNDERGROUND COAL SLURRY CONCENTRATING SUMP

Richard E. Doerr; David L. McCain, and Hilbert D. Dahl, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 15, 1974, Ser. No. 461,035
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **4 Claims**



1. An underground mine slurry sump for a plurality of slurry lines inside said mine;

said mine having at least a first tunnel and a second tunnel formed normal to said first tunnel, said sump comprising: a trench formed in said first tunnel and having first and second ends, a bottom tapering downward toward said second end and substantially vertical side walls;

second and third trenches formed in said second mine tunnel, the bottom of each said second and third trenches sloping downwardly into said first trench, said second and third trenches each having vertical side walls;

partition means formed at the intersection of the side walls of said first trench and the side walls of said second and third trenches to form a water storage chamber;

weir means formed through the top of said partition to permit excess water to decant from the deeper end of said first trench and from said second and third trenches by permitting water to flow into said water storage chamber;

water pump means connected between said water storage chamber and a source of water for said slurry mine system;

slurry pump means connected through the bottom of said second end to the surface of said mine for removing concentrated slurry from said sump, slurry inlet means communicating with said second and third trenches.

3,870,374

INTEGRAL IN-LINE DISCHARGE AIR GRAVITY CONVEYOR

Warren W. Wentzel, Jr., and Robert A. Harper, Jr., both of Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 26, 1972, Ser. No. 301,068
Int. Cl. B65g *53/20*
U.S. Cl. 302—28 **4 Claims**

1. A system for fluidized transport and bulk delivery of finely divided particulate material comprising

an elongate particulate material transport conduit having a floor portion of gas permeable material,

means for introducing a diffused upwardly directed flow of gas through said floor portion into said transport conduit to fluidize the particulate contents thereof,

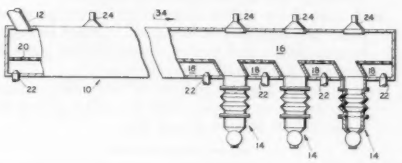
a plurality of bulk material discharge assemblies disposed in intersecting particulate material communication with the floor portion of said conduit at longitudinally spaced locations therealong and located intermediate the point of introduction of particulate material thereinto and a remote terminal end thereof, and

means located substantially above each of the discharge assemblies and adjacent the roof portion of said transport conduit for externally venting said fluidizing gas introduced through said floor portion thereof, and

each of said bulk discharge assemblies including,

a first inclined wall portion having its upper terminal end disposed coterminous with said floor portion and a second terminal end disposed a predetermined distance below the downstream thereof,

a second inclined wall portion having its upper terminal end disposed coterminous with said floor portion and in downstream spaced relation with the upper end of said first inclined wall portion and defining in said floor portin



a transversely disposed, unobstructed particulate material receiving aperture therebetween and extending substantially the full width of said floor portion, and having a second terminal end disposed in spaced relation with said second terminal end of said first inclined wall portion, said first and second inclined wall portions cooperatively defining an inclined bulk material transfer conduit downwardly dependent from the floor portion of said transport conduit,

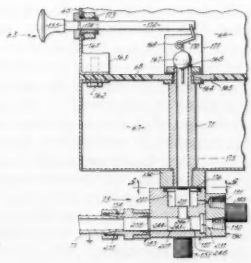
and selectively controllable delivery means disposed in bulk particulate material communication with the dependent end of said transfer conduit for effecting bulk delivery of particulate material accumulated therein upon demand therefor, with bulk particulate material flowing within said transport conduit being transported over said transversely disposed aperture when the transfer conduit is filled with particulate material.

3,870,375

POWDER SPRAY SYSTEM

Lane S. Duncan, Elyria; Simon Z. Tamny, Lorain, and Charles H. Riedy, Lakewood, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 194,830, Nov. 2, 1971, Pat. No. 3,746,254. This application June 5, 1972, Ser. No. 259,591
Int. Cl. B65g *53/40*
U.S. Cl. 302—42 **3 Claims**



1. A feeder for feeding a powder-air mixture comprising:

a fluidizing bed including a fluidizing chamber, a generally horizontal porous floor for said chamber and means for directing air through said floor into said chamber to fluidize powder therein;

a venturi pump having at least one small diameter air inlet opening into a large diameter expansion chamber, a powder inlet and an outlet;

means connecting said powder inlet of said venturi pump to said fluidizing chamber of said fluidizing bed so as to enable said venturi pump to draw powder from said fluidizing bed into said expansion chamber of said pump,

said connecting means comprises an elongated vertical passage having an inlet connected to the bottom of said fluidizing bed chamber and an outlet located vertically beneath said elongated passage inlet, said elongated passage outlet being connected to said powder inlet of said venturi pump for communicating powder from said bed to said venturi pump expansion chamber,

said connecting means comprising an elongated vertical pipe, said inlet of said elongated vertical passage being located above and out of the horizontal plane of said generally horizontal porous floor,

said elongated vertical pipe being horizontally spaced and separated from said generally horizontal porous floor by a non-porous portion of said floor.

3,870,376

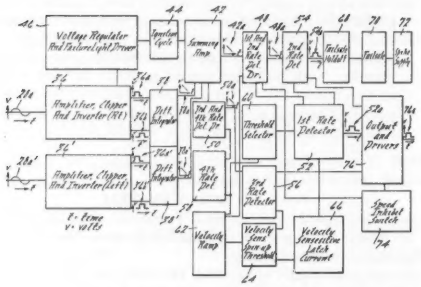
SKID CONTROL SYSTEM

Hugh E. Riordan, Wyckoff, N.J., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 761,045, Sept. 20, 1968, abandoned. This application Oct. 28, 1971, Ser. No. 193,393

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **32 Claims**



1. In a skid control system for controlling fluid pressure actuated brakes of at least one wheel of a wheeled vehicle by controlling the fluid pressure to the brakes via a modulating valve actuated to one condition for relieving the fluid pressure from an original high pressure to a lower pressure and to another condition for applying the fluid pressure toward the original high pressure, the invention comprising:

control circuit means for actuating the modulating valve to the one condition in response to a selected occurrence which is indicative of an incipient skid condition to allow said wheel to accelerate, said control circuit means comprising acceleration means responsive to acceleration of the wheel of a first high determinable magnitude which is substantially greater than zero following actuation of the modulating valve to the one condition for actuating the valve to the other condition, and further comprising velocity means for providing a velocity signal representative of the velocity of the vehicle and for varying said first determinable magnitude in response to variations in the magnitude of said velocity signal.

12. In a skid control system for controlling fluid pressure actuated brakes of at least one wheel of a wheeled vehicle on a surface, the method comprising the steps of: sensing the deceleration of the wheel and providing a signal for relieving the pressure for a predetermined time interval in response to a deceleration of a determinable magnitude, alternatively subsequently reapplying the pressure at the expiration of said preselected time interval whereby said preselected time interval is operative for lower coefficients of friction between the wheel and surface or subsequently reapplying the pressure in response to acceleration of the wheel of a second high determinable magnitude occurring prior to the expiration of said time interval.

3,870,377

BRAKE PRESSURE MODULATOR

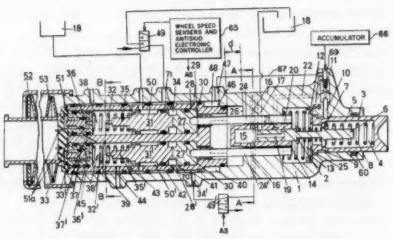
Juan Belart, Walldorf; Werner Fink; Dieter Kircher, both of Frankfurt, and Hubertus Von Grunberg, Niederhochstadt, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed July 9, 1973, Ser. No. 377,476

Claims priority, application Germany, July 15, 1972, 2234862; Oct. 9, 1972, 2249352

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **36 Claims**



1. A combined brake pressure modulator and brake actuator arrangement for an antiskid control system comprising:

a source of pressurized brake pressure medium;

a brake pressure medium reservoir;

a housing having a longitudinal axis;

a first chamber within said housing coupled to said source to receive said pressurized medium upon actuation of a brake actuator, said first chamber supplying said pressurized medium to at least a first of a plurality of brake circuits;

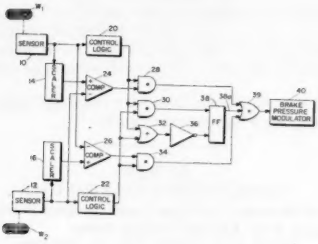
at least a first floating piston disposed in said housing spaced from said first chamber and parallel to said axis, said first floating piston having an actuating surface in transverse relation to said axis adjacent said first chamber, said first floating piston when actuated supplying braking pressure to at least a second of said plurality of brake circuits connected to said housing adjacent the surface of said first floating piston opposite and parallel to said actuating surface; and

at least a first control valve external to said housing having a first operating position to connect said first chamber to said actuating surface to thereby actuate said first floating piston by said pressurized medium upon actuation of said brake actuator and a second operating position to connect said actuating surface to said reservoir, said first control valve responding to an antiskid control signal to switch between said first and second operating positions to control the motion of said first floating piston to enable modulation of said braking pressure in said second of said plurality of brake circuits to prevent wheel lock.

3,870,378
ADAPTIVE BRAKING SYSTEM CONTROL WHEEL SELECTION BY COEFFICIENT COMPARISON

Ralph W. Carp, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 27, 1973, Ser. No. 391,925
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 EB **3 Claims**



1. In a wheeled vehicle braked by braking force, an adaptive braking system having means for attenuating braking force in response to a first signal and for subsequently restoring braking force in response to a second signal comprising:

first means for generating a signal related to the speed of a first vehicle wheel;

second means for generating a signal related to the speed of a second vehicle wheel;

control logic means for generating a first group of third and fourth signals in response to the signal generated by said first means and for generating a second group of third and fourth signals in response to the signal generated by said second means;

means responsive to the simultaneous generation of third signals of said first and second groups of signals for generating said first signal and subsequently responsive to the simultaneous generation of said fourth signals of said first and second group of signals for generating said second signal;

comparator means for generating a comparator output signal when the speed of one of said first and second vehicle wheels is without a predetermined relationship with the speed of the other of said first and second vehicle wheels; and,

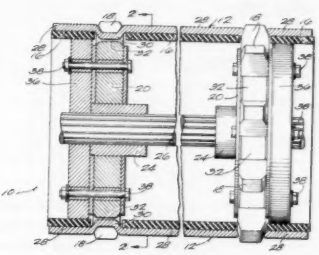
means responsive to said comparator output signal for applying only the group of third and fourth signals, of said first and second group, generated in response to the signal related to the speed of the faster rotating of said first and second vehicle wheels, to said means for attenuating braking force, the group of third and fourth signals so applied to said means for attenuating braking force thereby comprising said first and second signals respectively.

3,870,379
ENDLESS TRACTION ASSEMBLY

Guy D. Payne, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 11, 1972, Ser. No. 313,809
Int. Cl. B62d *65/24*; **B62m** *27/02*
U.S. Cl. 305—35 EB **10 Claims**

1. An endless traction assembly comprising a sprocket having a predetermined root diameter and uniformly spaced teeth extending from said root diameter, means for rotatably driving said sprocket, an endless track trained about said sprocket including two flexible belts positioned in spaced, parallel relation to each other, and a plurality of uniformly spaced and transversely extending traction bars mounted on the outer surface of said belts and each having at least one drive section with sprocket teeth engaging surfaces extending into the space between said belts for sequential engagement by said sprocket teeth, and being arranged with respect to said belts so that the line of engagement between said sprocket teeth and said sprocket engaging surfaces substantially coincides with the neutral axis of said track, a guide wheel having an outer diameter slightly greater than said root diameter, and

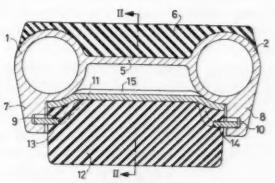


means for fixing said guide wheel to one side of said sprocket for common rotation therewith and in concentric relation thereto said guide wheel and with said outer diameter engaging one of said belts so as to locate said track for driving engagement between said traction bars and said sprocket along the track neutral axis and for maintenance of a small clearance between said drive sections and said root diameter.

3,870,380
TRACK LINK UNIT

Otto Korner, Wermelskirchen, Germany, assignor to DIEHL, Nurnberg, Germany

Filed Feb. 15, 1974, Ser. No. 443,009
Claims priority, application Germany, Feb. 16, 1973, 2307633
Int. Cl. B62d *55/20*
U.S. Cl. 305—36 **5 Claims**

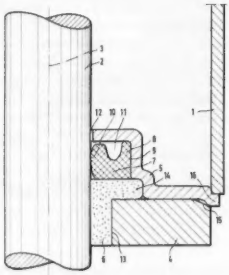


1. A track link unit which includes: a track link having lateral tubular members arranged in spaced relationship to each other, connecting means rigidly connecting said tubular members to each other, pad means connected to one and the same side of said tubular members, each of said tubular members having that side thereof which is opposite to and faces away from said pad means provided with a groove, said grooves facing each other, and a slip-on plate structure having a first resilient section with lateral portions resting against said lateral tubular members, said slip-on plate structure also having a second resilient section having its lateral end portions angled off from the major plane of said slip-on member toward the respective adjacent groove and resiliently engaging same.

3,870,381
GLAND ASSEMBLY

Franz Josef Overkott, Gevelsberg, Germany, assignor to Dr. Carl Ullrich Peddinghaus, Wuppertal-Barmen, Germany

Filed Mar. 12, 1973, Ser. No. 339,996
Claims priority, application Germany, Mar. 15, 1972, 2212471
Int. Cl. F16c 77/00
U.S. Cl. 308—3.5 1 Claim



1. A gland assembly for a piston rod of a piston and cylinder unit comprising:
- a guide bush having an axially extending portion and a radially extending flange;
- a pair of annular retaining members;
- an annular flexible seal element;
- the exterior surface of said axially extending portion of said guide bush engaging the inner surface of one of said annular retaining members to locate said one retaining member;
- the outer peripheral surface of said radially extending flange of the guide bush engaging a portion of the inner surface of the other retaining member;
- the outer periphery of said other annular retaining member on the side thereof adjacent to said other annular retaining member is chamfered;
- the outer edge of said other annular retaining member is cranked to engage on one side said chamfered part of said one retaining member and on the other side is adapted to be secured to the cylinder of said piston and said cylinder units; and
- said other annular retaining member having a centrally disposed dished portion to define with said radially extending flange of the guide bush a recess in which said annular flexible seal element is located.

3,870,382
AXIAL BEARING

Jacobus Pieter Reinhoudt, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,337
Claims priority, application Netherlands, Sept. 29, 1972, 7213192
Int. Cl. F16c 39/04
U.S. Cl. 308—9 3 Claims

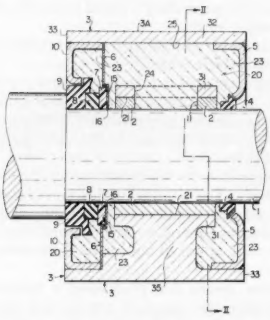
1. An axial bearing of the type having two faces rotatable with respect to each other, a medium present in a gap between the two faces during operation of the bearing, and at least two groove patterns which, upon relative rotational movement of the faces, produce oppositely directed pressures in the medium, wherein the geometry of the groove patterns is such that, for a given direction of rotation, a first pattern produces a positive bearing force dependent on the gap height with a high stiffness, and a second pattern having grooves deeper than the grooves of the first pattern produces a negative bearing force with low stiffness, so arranged that a gap height exists

at which the two bearing forces are equal and opposite, and the bearing has a high positive rigidity.

3,870,383
CASSETTE-TYPE BEARING UNIT

Nobukazu Morisaki, Aichi-ken, Japan, assignor to Daido Metal Company, Ltd., Kita-ku, Nagoya, Japan

Filed June 5, 1974, Ser. No. 476,608
Claims priority, application Japan, Oct. 3, 1973, 48-111296
Int. Cl. F16c 33/04
U.S. Cl. 308—82 7 Claims



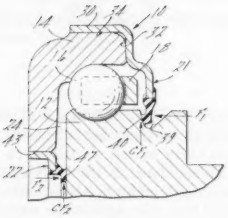
1. A cassette-type bearing unit comprising;
- a bearing housing including an annular inner wall concentric with the axis and extending in the axial direction, an annular outer wall concentric with said inner wall, and ribs extending radially between said inner and outer walls and connecting said inner and outer walls together in the radial direction, and further including a shaft hole defined by the inner surface of said inner wall, recesses formed inwardly of the both axial ends of said outer wall and outwardly of the end edges of said ribs, through holes defined by said ribs and establishing axial communication between said two recesses at positions radially outwardly of said inner wall an oil hole extending from said through hole to said shaft hole;
- a bushing-type plain bearing or a ball-and-roller bearing press fitted into said shaft hole to support together with said housing the load applied to the main shaft in the radial direction;
- a thrust plate inserted into at least one of said recesses to support the thrust produced in the main shaft;
- a thrust washer provided in at least one of said recesses to be in contact with said thrust plate and to be concentric with said shaft hole and adapted to support the thrust produced in the main shaft together with said thrust plate; first and second oil slingers having oil-throwing collars which are provided outwardly of the both ends of said bearing to be concentric with said bearing and adapted to prevent the outflow of lubricating oil running on the main shaft;

first and second end cups press fitted to the inner surface of the outer wall at the both axial ends of the housing;
and a fibrous member having oil affinity filled in said recesses and said through holes to hold lubricating oil and supply the lubricating oil to the bearing.

3,870,384
PRELOADING AND SEALING SYSTEM FOR CLUTCH BEARINGS

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 289,580, Sept. 15, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 432,232
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 **17 Claims**



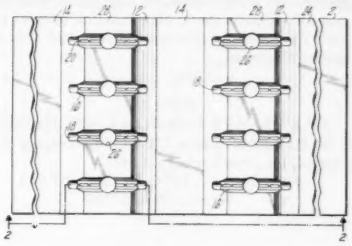
1. A clutch release bearing assembly comprising,
a first annular race member having means defining a first raceway thereon,
said first raceway being generally semi-circular in cross-section,
a second annular race member having means defining a second raceway thereon,
said second raceway being generally semi-circular in cross-section,
a plurality of generally spherical anti-friction bearing elements interposed between said first and second raceways,
a first seal means of generally circular shape extending from said first race member and making a first sealing force contact with a surface portion on said second race member,
a second seal means of generally circular shape extending from said first race member and making a second sealing force contact with another surface portion on said second race member,
said first sealing force being greater in magnitude than said second sealing force contact thus causing relative axial movement between the first and second raceways to preload the assembly.

3,870,385
INTERCONNECTING SYSTEMS AND DEVICES USING CONDUCTIVE ELASTOMER PELLETS IN PLANAR COMPONENT SUPPORTING STRUCTURES AND IN ELECTRONIC CIRCUIT CONNECTORS

Emik Avakian, 92 Juana St., Crestwood, N.Y. 10707, and David Laizerovich, Manchester, Conn., assignors to said Avakian, by said Laizerovich

Filed Sept. 10, 1973, Ser. No. 395,393
Int. Cl. H01r *9/00*; **H05k** *1/02*
U.S. Cl. 339—48 **18 Claims**

1. An interconnecting device fof electronic circuitry including:
a matrix having top and bottom surfaces;
a plurality of spaced parallel ridges in the top surface to define grooves therebetween;
a plurality of spaced notches in each ridge to define effectively aligned pyramids between the notches, each notch having a horizontal passage at the base thereof, each notch being less deep than the height of the ridges; and
a plurality of slugs of a conductive material positioned in vertical recesses extending upwardly from the bottom surface of the board in vertical alignment with the

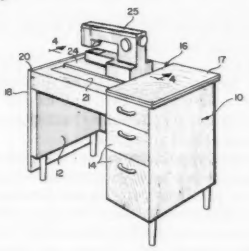


notches, the ridges having vertical openings from the top communicating with the slugs and connecting with the notches the slugs terminating below the base of the notch, the slugs being penetrable by a wire or pin inserted therein and, making contact therewith.

3,870,386
RETRACTION MECHANISM AND SEWING MACHINE CABINET

Don W. Shepherd, Glenview, Ill., assignor to A. C. Weber & Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 271,688, July 14, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,910
Int. Cl. A47b *81/00*
U.S. Cl. 312—30 **13 Claims**



1. A sewing machine cabinet adaptable for use with both a flat bed type sewing machine and a free arm type sewing machine, comprising in combination,
a cabinet having a pair of side walls, a back wall, and a front which is at least partially open, and a top wall having a cutout therein,
a storage well positioned below said cutout portion, access to said storage well being through said cutout portion,
the cutout portion having a front leading edge and a rear bounding edge, the rear bounding edge providing a mounting spot for a sewing machine assembly to be pivotally secured thereto, upon said mounting spots,
a bib pivotally secured to said fron leading edge of said cutout portion, said bib having an arcuate path of travel bounded at the lower portion of the arc by the top surface of said cabinet and having an arcuately upward oath of travel limited only by the top wall of said cabinet,
said bib further including support engaging means extending along the length thereof,
support means removably associated with said bib, said support means being engageable with said bib support engaging means in order to provide a support shelf for use in conjunction with a flat bed sewing machine and being

removably therefrom to accommodate the support of a free arm type sewing machine,

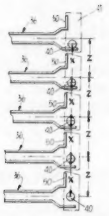
whereby the provision of a cabinet having a storage well and a pivotally secured bib mounted on the cutout portion, and having support means associated therewith, the support means being removably engageable with respect to said bib, renders the sewing machine cabinet useful for both flat bed type sewing machines and free arm type sewing machines.

3,870,387

FILE DRAWER INTERLOCK MECHANISM

Merle H. Mortashed, Union City, Calif., assignor to Harbor Universal, Inc., San Leandro, Calif.

Filed Mar. 27, 1974, Ser. No. 455,164
Int. Cl. E05b *65/46*
U.S. Cl. 312—218 **10 Claims**



1. In a cabinet having a plurality of slideable units mounting at first spaced intervals, an interlock device for preventing the opening of more than one unit, said interlock device comprising:

an interlock bar slideably secured to said cabinet in a generally vertical position;

a plurality of interlock members rotatably attached to said bar at second spaced intervals different from said first spaced intervals said first and second spaced intervals extending in a direction substantially normal to the sliding direction of said units and

a corresponding plurality of interlock channels secured to different ones of said units at said first spaced intervals in selective misalignment with said interlock members, said interlock channels having camming portions arranged in cooperative relationship with said interlock members so that the opening of a single unit forceably aligns the corresponding interlock member and channel and causes mis-alignment of the remaining interlock members and channels.

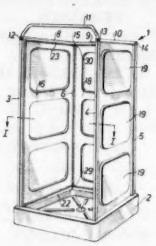
3,870,388

SELF-LOCKING CORNER JOINT FOR THE WALLS OF CUPBOARD-LIKE STRUCTURES

Stig Tore Johannes Lofgren, Taby, Sweden, assignor to Innovare I Taby Aktiebolag, Taby, Sweden

Filed Mar. 12, 1973, Ser. No. 340,306
Int. Cl. A47b *43/00*
U.S. Cl. 312—257 A **8 Claims**

1. A self-locking corner joint for structures such as cupboards, cabinets and the like comprising a frame structure having at least two substantially parallel rigid posts, a rear wall and two side walls fitted to said frame structure, each of said side walls having an edge section partially embracing one of said rigid posts on the surfaces of the latter facing the interior of the frame, each of said edge sections of said side walls having means defining a groove, said rear wall having edge sections provided with a flange, said flanges being received in and abutting the bottom of the respective groove in said edge sections of said side walls, said rigid posts and said side walls being consructed and arranged such that the distance between the bottoms of the grooves in said edge sections of said side walls when the latter are in their assembled position is less than the distance between the edges of said flanges on said rear wall when the latter is in its natural and unassembled state, said rear wall being made of a resiliently yieldable material such that the flanges of said rear wall abut the bottoms of the respective grooves in the edge sections of said side walls



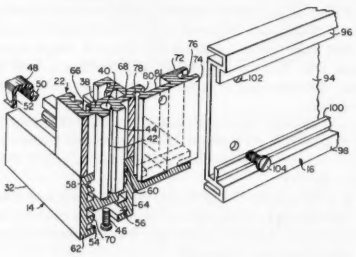
under resilient yielding of said rear wall when the latter and said side walls are in their assembled position in the frame, said rear wall being bowed slightly when the edges of said flanges are accomodated in the bottoms of said grooves to thereby continuously apply a biasing force urging said edge sections of said side walls against the respective rigid posts of said frame and thereby obviating the requirement for any additional holding elements for securing the corner joint.

3,870,389

FILING CABINET CONSTRUCTION

Oliver P. Killam, 269 Pleasant St., Marblehead, Mass. 01945

Filed July 9, 1973, Ser. No. 377,257
Int. Cl. A47b *43/00, 47/00;* **F16b** *12/00*
U.S. Cl. 312—257 R **7 Claims**



1. A cabinet for drawers and the like, comprising

a. elongated first frame members connected to one another to define a rectangular front frame section and a rectangular rear frame section,

b. at least one first frame member mounted vertically between the top and bottom first frame members of said front section, and between the side frame members thereof,

c. at least one elongated second frame member mounted to said rear frame section parallel to said one first frame member,

d. cooperating pairs of elongated coplanar third frame members horizontally connecting said front and rear frame sections,

e. said first frame member having a body portion formed with channels along two sides thereof, a flange along a third side thereof and a central core formed with a longitudinal passage adapted to threadably engage screws driven perpendicularly through the core of a perpendicularly adjacent first frame member, the sides of said chan-

nel being formed with oppositely facing longitudinal grooves,

f. said second frame member being substantially T-shaped in cross-section including a cross-piece serving as a drawer stop and a center leg extending between and supporting adjacent third frame members and formed with an elongated passage to threadably engage screws driven through the flange of mutually perpendicular first frame member of said rear frame section,

g. said third frame member being formed with a longitudinal flange adapted to slidably support a drawer mounted between each cooperating pair of third frame members,

h. an elongated facia piece formed with outwardly extending longitudinal parallel lips slidably mounted in the grooves of at least one of said channels and having a raised center portion extending outwardly beyond the channel portion to slidably support a drawer thereon, and,

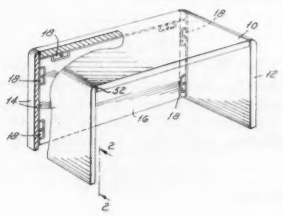
i. a rectangular drawer slidably mounted between each pair of said third frame members.

3,870,390

FURNITURE CONSTRUCTION

Frederick H. Herrmann, 3015 Lakehaven Ct., Ann Arbor, Mich. 48105

Filed July 23, 1973, Ser. No. 381,855
Int. Cl. A47b *47/00*
U.S. Cl. 312—263 **2 Claims**



1. In a furniture assembly comprising a plurality of panels to be joined, one normal to the other, that improvement which comprises:

a. a first panel having a plurality of short recesses opening to a converging side and edge thereof,

b. a receptacle bar secured in each of said recesses, each receptacle bar comprising a base plate to lie against the base of a recess, end plates normal to said base plate to extend to a terminal surface at the edge of the said first panel, and a ledge block extending from said base between said end plates having a bearing surface extending lengthwise between said end plates parallel to said base and lying in a plane disposed at a predetermined acute angle to said base, said block terminating at a face a predetermined distance away from said base and spaced within the terminal surfaces of said end plates,

c. a second panel having side walls and edge walls,

d. a support bar projecting from a wall of said second panel having a bar base plate secured to said second panel parallel to an edge wall thereof to fit within free space between the ends of said receptacle bar and a lodging block extending in cross-section outwardly from said bar base plate and longitudinally along said base plate having one bearing surface lying in a plane disposed at said same predetermined acute angle to said bar base plate, and

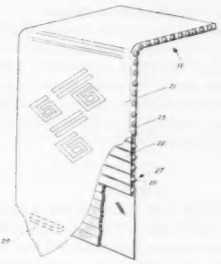
e. means transfixing said bars serving to secure said bars together with said bearing surfaces in complemental juxtaposition to hold said panels in tight engagement.

3,870,391

CABINET DOOR STRUCTURE

Vernon J. Nims, 2124 West Pine St., Orlando, Fla. 32805

Filed Aug. 20, 1973, Ser. No. 390,004
Int. Cl. E06b *9/08*
U.S. Cl. 312—297 **9 Claims**



1. A cabinet door structure comprising in combination:

a. a cabinet structure having an opening therein for a door;

b. a pair of guide channels attached to said cabinet structure for guiding a door therein and having curved portions;

c. a plurality of slats adapted to follow said guide channels to form a flexible door frame to cover said opening in said cabinet structure;

d. flexible backing material attached to said slats to hold said slats together in a flexible manner in spaced relationship to each other; and

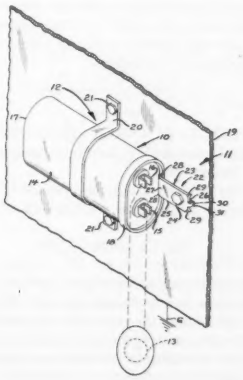
e. flexible and stretchable front door covering material removably attached over the front of said slats held together by said flexible backing material and over spaces between said slats to form a decorative front for said flexible door frame whereby said door structure can slide in said pair of guide chambers to cover and uncover the opening in said cabinet structure.

3,870,392

GROUNDING MOUNTING MEANS

Ralph W. Bond, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 14, 1973, Ser. No. 415,550
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R **14 Claims**



1. In an appliance such as an air conditioner, structure for mounting a capacitor in grounded association with a metal

wall provided with an insulating covering, the capacitor having a metal housing provided with a projecting metal portion having an insulating covering, said structure comprising:

means embracing the capacitor housing for retaining the capacitor to said wall;

a metal grounding clip having a first tooth portion engaging said capacitor housing projecting portion and a second tooth portion engaging said wall; and

means for urging said first tooth portion of the clip through said insulating covering of said capacitor housing projecting portion into electrical conductive association with said capacitor metal housing projecting portion and urging said second tooth portion of the clip through said wall insulating covering into electrically conductive association with said metal wall.

3,870,393

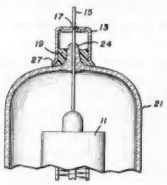
CORONA-FREE TOP CAP TERMINAL ASSEMBLY FOR ELECTRON DISCHARGE DEVICES

Robert L. Hill, Owensboro, Ky., and Othmar E. Ringeman, St. Meinrod, Ind., assignors to General Electric Company, Owensboro, Ky.

Filed Feb. 11, 1974, Ser. No. 441,053

Int. Cl. H01j *5/06*

U.S. Cl. 339—144 T **5 Claims**



1. An electron discharge tube comprising:

a. an evacuated envelope having a top wall portion with an external protuberance thereon;

b. at least one electrode sealed within said envelope;

c. a lead wire extending from said electrode, said wire passing through and sealed in said protuberance;

d. a cup-shaped top cap terminal disposed over said protuberance with the rim of said top cap disposed adjacent an outer surface of said top wall portion, and said top cap electrically connected to said lead; and

e. an electrically conductive cement disposed between said top cap, said protuberance, and said surface providing an electrically conductive path between said top cap rim and said surface and bonding said top cap to said protuberance and said top wall portion.

3,870,394

OPTICAL SCANNER MECHANISM

Johann Ploeckl, Unterhaching, Germany, assignor to Zellweger AG, Uster, Switzerland

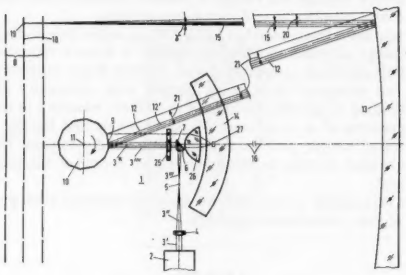
Filed July 20, 1973, Ser. No. 381,364

Claims priority, application Switzerland, Aug. 10, 1972, 11881/72

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **12 Claims**

1. An optical scanner mechanism, especially for optically discernible characters associated with or applied to articles, comprising a light source for generating a scanning light beam, guide means for determining a scanning region, a beam deflection mechanism including a movable component having a central axis and serving for transmitting the scanning light beam to said scanning region determined by said guide means, said movable component of said beam deflection mechanism incorporating reflecting surface means, optical means for directing the bundle of light rays emanating from the light source against the reflecting surface means of said beam deflection mechanism, a concave mirror, a substantially torus-shaped meniscus lens arranged between said beam deflection mechanism and said concave mirror for reducing the effects of possible non-parallelism of said reflecting surface means of



the movable component with respect to its central axis, the scanning light beam which is reflected by the reflecting surface means of said beam deflection mechanism being directed by said torus-shaped meniscus lens member against the concave mirror, said concave mirror focusing said scanning light beam reflected by the concave mirror at said scanning region determined by the guide means.

3,870,395

CONNECTING PLUG FOR OPTICAL GLASS FIBERS

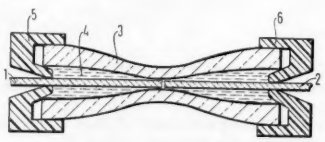
Dieter Schicketanz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 5, 1973, Ser. No. 376,345

Claims priority, application Germany, July 10, 1972, 2233916

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 C **4 Claims**



1. A reusable connecting plug for connecting two optical glass fibers in light transmitting relationship, said fibers each having a central core surrounded by a casing, said core having a higher index of refraction than said casing, said plus comprising a rigid capillary tube having an inner diameter slightly greater than the outer diameter of the fibers to be connected, the inner diameter of said tube increasing gradually towards the ends thereof, said tube being adapted to receive two glass fibers inserted into opposite ends thereof, said fibers adapted to contact each other at the reduced portion of said tube, said capillary tube having an index of refraction equal to that of said casing.

3,870,396

OPTICAL COUPLER

Jerome G. Racki, and Frank L. Thiel, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 5, 1973, Ser. No. 376,579

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 WG **18 Claims**

1. A light coupler for use in an optical communication

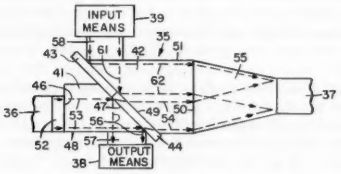
system including first and second sections of optical signal transmission line, said coupler comprising

a first transparent member having first and second opposed, nonparallel planar surfaces and a third planar surface intersecting said second planar surface and making an acute angle therewith,

a second transparent member having first and second opposed, nonparallel planar surfaces and a third planar surface intersecting said second surface and making an acute angle therewith, at least a portion of said second surface of said second member being parallel to and slightly spaced from said second surface of said first member,

a first sheet of transparent material disposed between said first and second members, the refractive index of said sheet being less than those of said members, said sheet being disposed adjacent to at least a portion of said second surface of said first member and being disposed adjacent to less than the entire second surface of said second member,

a layer of transparent material disposed adjacent to that portion of said second surface of said second member that is not adjacent to said first sheet, the refractive index of said layer being lower than that of said first sheet,



first coupling means disposed adjacent to said first surface of said first member for coupling an optical signal from said first section of optical signal transmission line into said first member, the longitudinal axis of said first section of transmission line making an angle other than 90° with said second surface of said first member,

output means for receiving that light which reflects from the interface between said first member and said first sheet, second coupling means disposed adjacent to said third surface of said first member for coupling light between said first member and said output means,

input means for providing an input optical signal,

third coupling means for coupling said input optical signal into said third surface of said second member at such an angle that said input optical signal is substantially totally reflected from the interface between said layer and said second member,

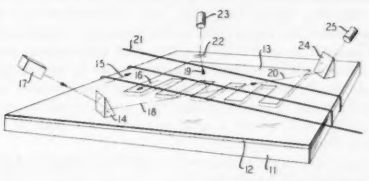
fourth coupling means disposed adjacent to said first surface of said second member for combining said input optical signal and the unreflected portion of the optical signal from said first member and coupling the resultant optical signal into said second section of optical signal transmission line, and

means for replacing said first sheet with a second sheet having a refractive index which is different from said first sheet and which is less than the refractive indices of said members.

3,870,397
THIN FILM MAGNETO-OPTIC SWITCH

Joseph Francis Dillon, Jr.; Ernst Michael Gyorgy Madison, and Legrand Gerard Van Uitert, all of Morris Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1973, Ser. No. 415,369
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **17 Claims**

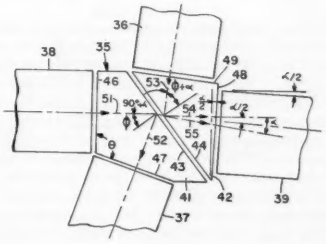


1. Device comprising a thin magnetic film transparent to electromagnetic radiation propagating in the plane of the film, means for inserting electromagnetic radiation into the film, means for extracting energy corresponding to radiation traveling in the plane of the film, means for magnetically biasing the film characterized in that said device has a pattern defined by a region of a composition different from the composition of the area surrounding the region and whose coercivity is different from that of the area surrounding said regions, said difference in coercivity being due to said different composition and allowing said regions to be switched selectively by means of an external magnetic field between at least two magnetic states, in at least one of said states the regions being magnetically saturated and in at least one of said states their magnetization having a component in the direction of propagation of said electromagnetic radiation, said electromagnetic radiation being caused to follow a path which differs in accordance with said magnetic state of said regions.

3,870,398
PASSIVE COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Roy E. Love, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 5, 1973, Ser. No. 376,574
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 C **10 Claims**



1. A light coupler for use in an optical communication system including first and second optical signal transmission lines, each of which comprises at least one optical waveguide having an acceptance half angle β, each of said transmission lines having an end portion which terminates in an endface that is substantially perpendicular to the axis of said end portion, the axes of said end portions being substantially disposed in a reference plane, said first transmission line being adapted to provide a first optical signal, said light coupler comprising first and second transparent members, each of which has at

least first, second and third planar surfaces which lie in planes that are perpendicular to said reference plane, said first surface of said second member being parallel to and slightly spaced from said first surface of said first member, said second surface of said first member being disposed in light-receiving relationship with respect to the first optical signal radiating from said endface of said first transmission line, the angle between the axis of said first transmission line and the local perpendicular to said first surface of said first member being ϕ, the angle between said second and third surfaces of said first member being $180°-2\phi$, said endface of said second transmission line being disposed in light-receiving relationship with respect to said second surface of said second member, said second surface of said second member being substantially perpendicular to the axis of said second transmission line, the angle between the axes of said first and second transmission lines being $\alpha/2$, where α is an angle greater than 0° but no greater than the angle β,

a layer of air disposed between said first surfaces of said first and second members,

means for directing a second optical signal onto said third surface of said second member, said second optical signal being directed toward said first surface of said second member at an angle $\phi+\alpha$ with respect to the local perpendicular at said first surface of said second member, the angle $\phi+\alpha$ being greater than the critical angle of the interface between said second member and air, and

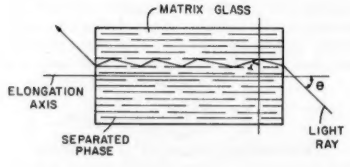
output means for receiving that portion of said first optical signal which reflects from said first surface of said first member, the remaining portion of said first optical signal being transmitted across said layer of air and into said second member.

3,870,399

PSEUDO-FIBER OPTIC DEVICES

Lyman J. Randall, and Thomas P. Seward, III, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,594
Int. Cl. G02b 5/14
U.S. Cl. 350—96 B **6 Claims**



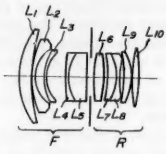
1. A pseudo-fiber optic device consisting of a phase-separated glass article comprising a continuous glass light-transmitting phase in the form of a matrix and an internal discontinuous light-reflecting phase in the form of elongated particles uniformly dispersed throughout the matrix, oriented essentially parallel with respect to one another in the direction of elongation, said particles having an index of refraction less than that of the glass light-transmitting phase and aspect ratios of at least about 5:1.

3,870,400

WIDE-ANGLE LENS SYSTEM WITH MOVABLE LENS FOR CORRECTING SHORT DISTANCE PHOTOGRAPHIC FACULTY ARRANGED NEAR DIAPHRAGM

Nobuo Yamashita, and Toru Fujii, both of Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed May 7, 1973, Ser. No. 358,122
Claims priority, application Japan, May 10, 1972, 47-46085
Int. Cl. G02b 9/64
U.S. Cl. 350—214 **4 Claims**



3. A wide-angle lens system comprising a front lens group F and a rear lens group R separated by a diaphragm space, said wide-angle lens system effecting focussing by movement of the whole lens system, said rear lens group R including a movable lens arranged near said diaphragm and adapted for correcting the short distance photographic faculty, said movable lens consisting of a lens adapted to be moved along an optical axis when said whole lens system is focussed to the short distance, said movable lens being a positive lens adapted to be moved in response to the change of its distance from an object toward said diaphragm, and the conditions

$$0.6 < |f_m/f| < 3.5 \text{ and}$$
$$|f_{FB}| < 1.0\,|f_F|$$

are satisfied where f_m is the focal length of said movable lens, f is the overall focal length of the total lens system, f_F is the focal length of the front lens group F followed by the movable lens and f_{FB} is the back focal length of the front lens group F followed by the movable lens.

3,870,401

INVERTED TELEPHOTO-TYPE LENS

Trude Muszumanski, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation-in-part of Ser. No. 130,582, April 2, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 342,884
Claims priority, application Austria, Apr. 8, 1970, 3237/70
Int. Cl. G02b 9/64, 9/04
U.S. Cl. 350—214 **8 Claims**

1. An inverted telephoto-type lens having far and near conjugate foci and comprising

a negative forward lens element group disposed at that end of the lens which faces said far conjugate focus, and

a positive rear lens element group disposed at that end of the lens which faces said near conjugate focus and separated from said forward lens element group by a substantial air gap,

said forward lens element group consisting of a first negative lens component and a biconcave second lens component, said biconcave lens component has a rear surface adjoining said air gap and a forward surface remote from said air gap,

said forward and rear surfaces having radii of curvature r_3 and r_4, respectively, which meet the condition:

$2r_4 < r_3 < 4r_4$.

3,870,402

WIDE, ANGLE, HIGH APERTURE RATIO, LONG BACK FOCUS LENS SYSTEM

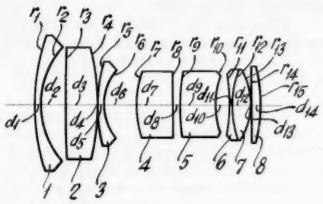
Yasuo Takahashi, Tokyo, and Sadao Okudaira, Saitama-ken, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 17, 1973, Ser. No. 380,050

Claims priority, application Japan, July 25, 1972, 47-74426

Int. Cl. G02b *1/00, 9/00*

U.S. Cl. 350—214 **3 Claims**



1. A wide angle, high aperture ratio, long back focus lens system comprising eight successively designated lens elements in which the sixth and seventh lens elements are joined at their confronting faces to form a doublet, the lens system having the following dimensions and relationships, the lens faces being successively designated from the first to the fifteenth faces with the confronting faces of the sixth and seventh lenses defining a singly designated lens face:

r_1	231.5	d_1	8.0	n_1/ν	1.64000/60.2
r_2	95.8	d_2	26.9		
r_3	974.8	d_3	34.5	n_2/ν_2	1.80610/40.8
r_4	−330.0	d_4	0.4		
r_5	202.8	d_5	8.5	n_3/ν_3	1.62041/60.3
r_6	60.2	d_6	36.4		
r_7	118.9	d_7	41.7	n_4/ν_4	1.81554/44.5
r_8	7148.9	d_8	8.8		
r_9	270.2	d_9	38.1	n_5/ν_5	1.80518/25.4
r_{10}	109.6	d_{10}	15.5		
r_{11}	−382.9	d_{11}	4.2	n_6/ν_6	1.80518/25.4
r_{12}	122.3	d_{12}	19.1	n_7/ν_7	1.80300/46.7
r_{13}	−103.9	d_{13}	0.4		
r_{14}	888.1	d_{14}	10.3	n_8/ν_8	1.80300/46.7
r_{15}	−249.0				

wherein r_j is the radius of curvature of the jth lens face, d_k is the distance between the jth lens face and the next successive lens face, n_i is the refractive index and ν_i is the Abbe number of the ith lens.

3,870,403

ADJUSTABLE DENSITY ANTI-GLARE VISOR FOR VEHICLES

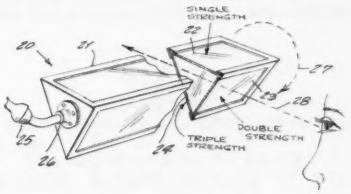
John H. Ward, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed June 25, 1973, Ser. No. 372,988

Int. Cl. G02b *5/22;* **B60j** *3/04*

U.S. Cl. 350—276 **3 Claims**

1. A transparent visor for reducing variably glare on the eyes of a vehicle driver, comprising a frame having a polygonal transverse and an extended longitudinal cross-section dimension with external sides in the longitudinal dimension having tinted transparent windows therein to reduce glare effect of light passing through said windows, each window being disposed at an angle to each adjacent window whereby light reaching the driver's eyes will pass through two windows,



said frame being rotatably mounted on a shaft having an axis coincident with the longitudinal axis of said frame, whereby the frame can be rotated to predetermined positions wherein said light will pass successively through two windows at selected angles.

3,870,404

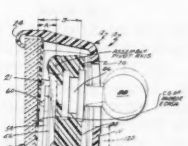
MIRRGR ACTUATOR AND SUPPORT MEANS THEREFOR

Harold R. Wilson, and Marc A. Kamerling, both of Holland, Mich., assignors to Donnelley Mirrors, Inc., Holland, Mich.

Filed May 1, 1973, Ser. No. 356,075

Int. Cl. B60r *1/04*

U.S. Cl. 350—281 **27 Claims**

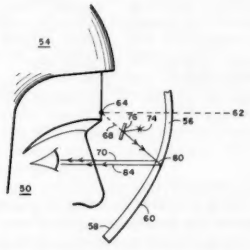


1. A day-night mirror assembly comprising a mirror case, a prismatic mirror element having non-parallel, generally planar front and back surfaces supported and retained therein, and an actuator means for shifting said case and mirror element with respect to a support external of said assembly between a predetermined reflectivity day position and a reduced reflectivity night position, said actuator means including two side edges and two spaced, generally parallel shaft means for supporting said actuator means in said case; said case including spaced support means for pivotally supporting said actuator means therebetween; said support means including a one-piece support member adjacent and along each side edge of said actuator means, each of said support members including means defining apertures having completely closed peripheries for receiving the ends of both of said shaft means along one side edge of said actuator means whereby said two shaft means and their corresponding apertures are maintained in the same spaced relationship by said one-piece support member throughout said shifting of said case and mirror; said support members being movable with respect to one another to permit insertion of said actuator means; and locking means for positively securing said support members following insertion of said actuator means to retain said actuator means in position in said case.

3,870,405
HELMET SIGHT VISORS

George D. Hedges, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 12, 1973, Ser. No. 369,357
Int. Cl. G02b 5/10
U.S. Cl. 350—294 6 Claims



1. A visor for use with a helmet sight system, which comprises:

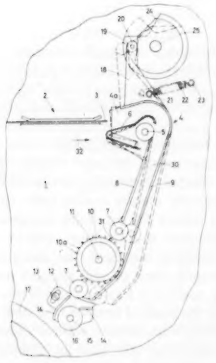
a concave inner surface whose shape is a first paraboloid of revolution having a first axis; and

a convex couter surface whose shape is a second paraboloid of revolution having a second axis, said second axis being substantially coincident with said first axis, said outer surface and said inner surface being substantially cofocal, so that the reflections of a light ray from said inner surface and said outer surface will be substantially parallel.

3,870,406
MECHANISM FOR MOVING FILM INTO AND FROM ENGAGEMENT WITH SPROCKETS IN MOTION PICTURE PROJECTORS

Rodolfo Nebbia, Torino, Italy, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed Mar. 9, 1973, Ser. No. 339,944
Claims priority, application Germany, Mar. 15, 1972, 2212422
Int. Cl. G03b 1/56
U.S. Cl. 352—159 5 Claims

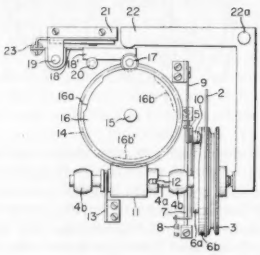


1. In a motion picture projector, a combination comprising a housing; a reel rotatably supported by said housing; at least one film advancing device supported by said housing and operable to advance motion picture film lengthwise along a predetermined path one end of which is adjacent to said reel; a film gate remote from said reel and arranged to guide the film along a portion of said path; elastic loop former means adjacent to said path between said gate and said advancing device; shifting means actuatable to establish or terminate a driving connection between said advancing device and the film, said shifting means including film guide means pivotable between first and second positions in which said advancing device respectively drives and is disengaged from the film, said film guide means defining an elongated channel for the film and having an opening through which said advancing device extends into said channel at least in the first position of said film guide means; means for pivotably supporting said film guide means in the region of said loop former means; and actuating means for moving said film guide means with respect to said advancing device.

3,870,407
FILM SPEED CHANGE-OVER DEVICE IN A MOTION PICTURE PROJECTOR

Shigeo Wakahara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 14, 1974, Ser. No. 479,507
Claims priority, application Japan, June 20, 1973, 48/73355
Int. Cl. G03b 1/22
U.S. Cl. 352—194 10 Claims



1. A film speed change-over device in a motion picture projector having a rotatable shutter shaft, the device comprising:

a film-feeding pawl;

driving means for moving the film-feeding pawl into a predetermined position to engage a perforation in the film and then for moving the film-feeding pawl in the desired direction of film movement to advance the film a single frame;

camming means for rotation at $1/n$ times the speed of rotation of the shutter shaft, where n is an integer, the camming means providing a camming surface having a radially recessed portion and a radially projecting portion;

change-over means including a cam follower biased to engage said camming surface, the cam follower and the camming means being axially movable relative to each other for enabling the cam follower to be moved selectively to a first axial position in engagement with the camming surface and to second and third axial positions out of engagement with the camming surface, the cam follower in said first axial position having a first radial position when received by said recessed portion of the camming surface and a second radial position when engaging said projecting portion of the camming surface; and

holding means for holding the cam follower in substantially said first radial position when the cam follower is in said second axial position and for holding the cam follower in substantially said second radial position when the cam follower is in said third axial position, said change-over means having means cooperable with the driving means for permitting movement of the film-feeding pawl into said predetermined position when the cam follower is in substantially one of said first and second radial positions

and for preventing movement of the film-feeding pawl into said predetermined position when the cam follower is in substantially the other of said first and second radial positions.

3,870,408

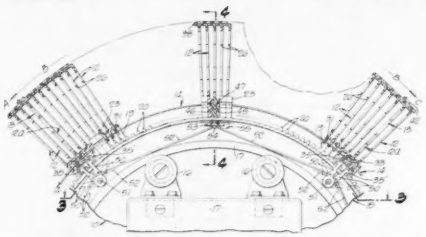
VARIABLE CAPACITY FLEXIBLE SLIDE MAGAZINE

Frederick M. Kirr, Sunland, Calif., assignor to Spindler & Sauppe, Inc., North Hollywood, Calif.

Filed Mar. 20, 1972, Ser. No. 236,302

Int. Cl. G03b *21/00, 23/06*

U.S. Cl. 353—120 **47 Claims**



1. A slide magazine comprising a multiplicity of thin-walled plaques arranged side by side and with adjacent pairs of plaques cooperating to hold a single image slide therebetween, and means for locking said multiplicity of plaques captively assembled to one another with limited freedom to pivot toward and away from one another, whereby said slide magazine is adapted for use selectively in a rectilinear rack feed and in a drum feed slide projector mechanism.

3,870,409

STORAGE DEVICE FOR INFORMATION RECORDING SHEETS

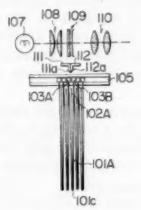
Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Jan. 23, 1973, Ser. No. 326,106

Claims priority, application Japan, Jan. 25, 1972, 47-9235; Jan. 25, 1972, 47-9238

Int. Cl. G03b *23/08*

U.S. Cl. 353—27 **17 Claims**



8. A storage device for information recording sheets, comprising information recording sheets support means capable of being bent in zigzag fashion and movable in a bellows-like fashion between an extended position and a contracted position to form crests and valleys, a number of support pins each mounted on one of the crests formed in said information recording sheets support means bent in zigzag fashion, a pair of guide channels for slidably supporting opposite ends of said support pins and for guiding the pins in their movements, information recording sheets holding portions provided in said information recording sheets support means, means for moving any selected pair of adjacent support pins apart along the guide channels to thereby extend and straighten the portion of the support means disposed between the last recited pair of support pins while maintaining all other adjacent pairs of support pins close to each other, and means for selectively projecting optically the information on any information recording sheet held by the holding portions of the extended portion of the support means between the moved apart support pins, wherein means for fixing and holding a lowqer end portion of each information recording sheet are provided in each valley formed in said information recording sheets support means bent in zigzag fashion.

3,870,410

MARK READER

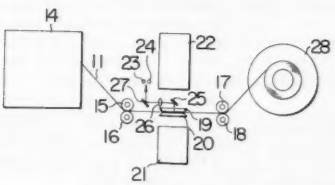
Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1973, Ser. No. 392,178

Claims priority, application Japan, Sept. 12, 1972, 47-90921

Int. Cl. G03b *23/12, 21/11*

U.S. Cl. 353—26 **6 Claims**



1. A system for indexing with a projection position a selected frame of a film roll having a plurality of frames and a plurality of frame marks, each mark associated with a frame and capable of modulating a light beam, including:

means for moving the film along a defined path to thereby move successive film frames along a frame path intersecting the projection position and to move the marks along a mark path;

means for generating a light beam intersecting the mark path and modulated by the frame marks traversing the beam as the film moves along its path;

a first and a second detector disposed in the path of the modulated beam and spaced from each other along the mark path by a distance less than the maximum width of the modulated beam so that the first detector and then both detectors are illuminated by the modulated beam as a mark traverses the beam moving in a first direction along the mark path, but the second detector and then both detectors are illuminated by the modulated beam as a mark traverses the beam moving in the opposite direction along the mark path, each detector providing a mark detection signal when illuminated by the modulated beam;

first and second means for nonlinearly transforming the mark detection signals of said first and second detector respectively to provide a respective first and second transformed signal;

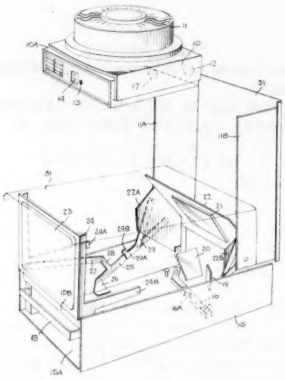
means for comparing the transformed signals and for providing on the basis of the comparison a signal indicating the direction of movement of the film along its path and the number of frames that have traversed the projection position, and means responsive to said signal to stop the film when a selected film frame is indexed with the projection position.

3,870,411

COLLAPSIBLE SLIDE PROJECTION THEATRE

Robert C. Schwartz, Woodmere, N.Y., and Frederick Burke, Riverside, Conn., assignors to Motiva, Ltd., New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,643
Int. Cl. G03b *21/28, 21/30*
U.S. Cl. 353—73 **6 Claims**



1. A compact, collapsible theatre for a standard slide projector having a box-like housing on whose front wall is mounted a projection lens that is disposed adjacent one side of the housing, said theatre comprising:

A. an open top box-like casing for accommodating said projector and having a narrow zone therein at one end of the casing in advance of the front wall of the housing, the optical axis of said projection lens being parallel to the side of the casing which corresponds to said one side of said housing, said casing having a width which is substantially the same as that of said housing and a height substantially the same as that of said housing;

B. a translucent screen hinged to said casing at the other end thereof and shiftable from an operative position in which the screen is erect, to a collapsed position in which the screen is folded over the top of the casing;

C. a reflecting system constituted by a minor reflector disposed in said zone and oriented to receive an image from said lens and to direct it laterally onto an intermediate reflector disposed in said zone and oriented to direct the image upwardly toward a major reflector, said major reflector being hinged to said casing at said one end thereof and being shiftable from an operative position in which it is oriented to direct the image received from the intermediate reflector onto the rear of said erect screen along an optical path parallel to the optical axis of said projection lens, to a collapsed position in which it is folded over the top of the casing; and

D. a cover for said casing, said cover being operatively linked both to said screen and said major reflector whereby when said cover is lifted it causes both said screen and said major reflector to shift to their operative positions at which point the cover extends therebetween, and when said cover is lowered it causes both said screen and said major reflector to shift to their collapsed positions, at which point the cover lies thereover to enclose said casing.

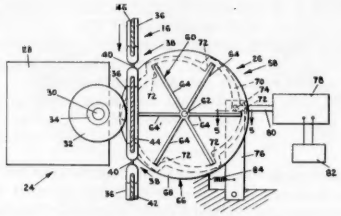
5. A theatre as set forth in claim **1**, wherein the linkage between said cover and both said screen and said major reflector includes a lever arm, one end of which is pivotally connected to said cover, a point adjacent the other end being pivotally connected to a fulcrum mounted on the base of said casing, said arm being tilted upwardly when said cover is lifted, said screen being coupled to said arm by a first link member and said major reflector being coupled to said arm by a second link member whereby when said arm is tilted, said screen and said major reflector are shifted to their operative positions.

3,870,412

SLIDE PROJECTOR

John R. DenBleyker, 644½ E. 10th St., Holland, Mich. 49423

Filed Apr. 16, 1973, Ser. No. 351,315
Int. Cl. G03b *23/08, 23/12*
U.S. Cl. 353—109 **12 Claims**



1. A slide projector for projecting slides connected together in a continuous chain comprising:

A light source and lens mounted in the projector and defining a viewing position for slides therebetween;

electrically operated drive means for successively moving each slide in the continuous chain through the viewing position in the projector, said drive means being adapted upon actuation to move the slide continuously through the viewing position until deactuated;

stop means in the slide projector adapted to sense the position of each individual slide in the chain as it passes through the projector, said position being sensed independently of the position or movement of the drive means, said stop means being further adapted to automatically engage the chain of slides and stop the chain of slides each time the stop means senses a slide in the viewing position;

release means adapted to release the stop means; and

control means adapted to actuate the drive means in response to the release of the stop means and to deactuate the drive means in response to the stopping of the chain of slides by the stop means.

3,870,413

MICROFICHE DRIVE ASSEMBLY AND TRANSPORT ASSEMBLY

Joseph Goebel, The Hague, Netherlands, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 16, 1973, Ser. No. 389,025
Int. Cl. G03b *27/58*
U.S. Cl. 355—53 **25 Claims**

1. A drive assembly comprising

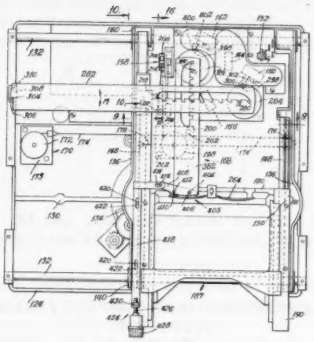
an elongated rack,

a plurality of slots disposed along said rack,

a plurality of drive pins releasably engageable with said rack by receipt within said slots,

means for positioning said drive pins in varying ones of said slots to thereby cause relative movement between said

rack and said drive pins along a path of travel and means for mounting said rack and for preventing movement



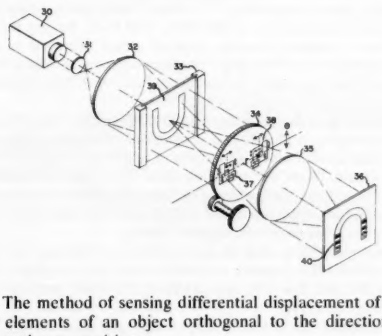
of said rack by said positioning means along said path of travel during said relative movement.

3,870,414

METHOD FOR SENSING SURFACE DISPLACEMENT ORTHOGONAL TO THE DIRECTION OF OBSERVATION

Donald E. Duffy, Edmond, Okla., assignor to General Electric Company, Syracuse, N.Y.

Filed May 25, 1973, Ser. No. 363,974
Int. Cl. G01b *9/02*
U.S. Cl. 356—109 **9 Claims**



1. The method of sensing differential displacement of surface elements of an object orthogonal to the direction of observation comprising:

a. imaging said observed object under conditions of illumination providing appreciable surface detail at spatial frequencies suitable for resolving the orthogonal surface displacements to be sensed,

b. recording two correlatable images of said object between which surface elements of said object are displaced relative to the observer in a direction orthogonal to the direction of observation,

c. simultaneously superimposing elements of said correlatable images without relative rotation upon a transparency,

d. illuminating said transparency by a narrow spectral band light source, and

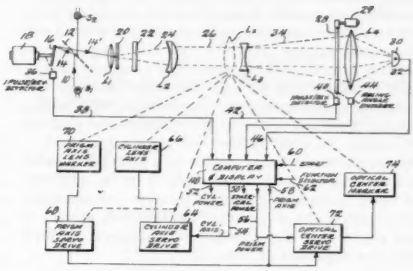
e. imaging said transparency through a narrow band spatial filter positioned to form an interference pattern whose spacing and orientation indicates the magnitude and direction of differential orthogonal displacement of said surface elements.

3,870,415

METHOD AND MEANS FOR MEASURING THE REFRACTIVE PROPERTIES OF AN OPTICAL SYSTEM

Tom N. Cornsweet, Washington, D.C., assignor to Acuity Systems, Incorporated, McLean, Va.

Filed Oct. 27, 1972, Ser. No. 301,365
Int. Cl. G01b *9/00*
U.S. Cl. 356—124 **28 Claims**



1. Apparatus for measuring refractive properties of an optical system, said apparatus comprising:

source means for directing an incident beam of light rays onto said optical system,

a rotatable ruling disposed to intercept a refracted light beam passing from said optical system,

photodetector means disposed to intercept the refracted light beam after it has been chopped by said ruling as a result of relative motion between said refracted light beam and said ruling to thereby produce signal pulses, and

computation means for analyzing said signal pulses over one revolution of said ruling to provide a quantitative measure of at least one refractive property of said optical system, and wherein

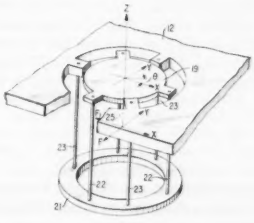
said source means comprises drive means for rotating said incident beam at a predetermined radius to sweep out a cylindrical surface with the incident beam.

3,870,416

WAFER ALIGNMENT APPARATUS

Kevin James Brady, Murray Hill; Victor Andrew Firtion, Secaucus; Leif Rongved, Summit, and Thomas Edward Saunders, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Jan. 9, 1974, Ser. No. 432,082
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 **9 Claims**



1. Alignment apparatus comprising:

means for supporting an object to be aligned comprising a support platform;

a plurality of substantially parallel first rods extending from the support platform to a relatively movable linking member;

a plurality of second rods substantially parallel to the first rods extending from the linking member to a relatively stationary table member; and

means for adjusting the orientation of the support platform while observing the object, thereby to align the object with a reference.

9. A method for aligning a wafer pattern with a mask pattern comprising the steps of:

mounting the wafer on a support platform having a plurality of substantially parallel flexible first rods extending therefrom to a linking member, and a plurality of second rods substantially parallel to the first rods extending vertically upwardly from the linking member to a support table;

optically superimposing the mask and wafer patterns;

observing the superimposed patterns through a microscope;

applying horizontal forces so as to displace the platform and to align the wafer pattern with the mask pattern;

said horizontal forces being applied to a positioning member extending vertically downwardly from the platform, and being applied at a vertical location corresponding substantially to the midpoints of the first rods, thereby to avoid any vertical displacement of the support platform during the alignment process.

3,870,417

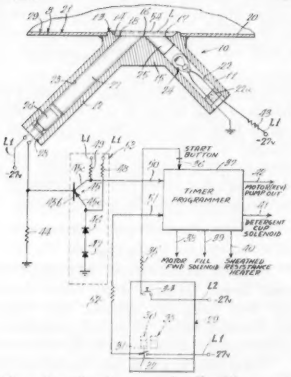
SENSOR FOR DISHWASHER

Larry Thomas Bashark, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 17, 1973, Ser. No. 380,101

Int. Cl. G01n *21/24*

U.S. Cl. 356—208 **28 Claims**



1. In a dishwasher having a tub, liquid sensor means mounted in a lower wall portion of said tub, said sensor means comprising: means defining a well opening upwardly to said tub for receiving and holding a preselected quantity of liquid from the tub, said well having a bottom wall; means for directing preselected light upwardly through said bottom wall to be redirected downwardly by liquid in said well; means for sensing light so deflected; and means providing an output signal corresponding to the level of the sensed deflected light.

3,870,418

EXPOSURE METER

Soichi Nakamoto, Machida, and Takeshi Yanagisawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

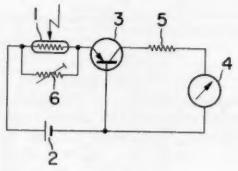
Filed June 23, 1972, Ser. No. 265,520

Claims priority, application Japan, June 25, 1971, 46/46125

Int. Cl. G01j *1/44, 1/42*

U.S. Cl. 356—226 **2 Claims**

1. A light exposure indication system comprising a transistor having emitter, base, and collector electrodes; current indicating means connected between said collector and base electrodes for indicating current therethrough, a DC voltage source and a photosensitive element connected in series between said base and emitter electrodes; said DC voltage source being the only biasing potential for said transistor.



3,870,419

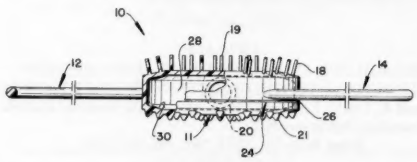
BACK SCRUBBER, MASSAGER AND LOTION APPLICATOR

George H. Sage, P.O. Box 732, Galveston, Tex. 77550

Filed Oct. 23, 1973, Ser. No. 408,812

Int. Cl. A47k *7/03;* **A61h** *7/00*

U.S. Cl. 401—8 **6 Claims**



1. Apparatus for scrubbing, massaging, and applying liquid to one's back comprising a resilient body having opposed faces and bounded by a side wall, said body having means forming a chamber therein, opposed straps attached to and depending from said body for enabling a person to hold a strap in each hand in order to scrub his back with said opposed faces;

a plurality of fingers affixed to and depending from one of said faces, a plurality of projections depending from the other of said faces, a plurality of apertures formed in one of said faces for enabling fluid flow to occur therethrough; means forming a deformable soap receiving slot about a marginal portion of said side wall; said slot being spaced between said opposed faces;

thereby enabling a bar of soap to be forced through the slot and into the chamber so that the soap can co-mingle with water and flow through said apertures while one is scrubbing his back;

a container for a lotion supply, said container having opposed faces and bounded by a side wall to form a chamber therewithin, outlet means for enabling lotion to flow from the last said chamber;

said container being of a size relative to said chamber of said resilient body to be received therein and through said slot.

3,870,420

PAINT TRAY

Gary D. Hawk, Iola, Kans., assignor to Harding Development Company, Warren, Mich.

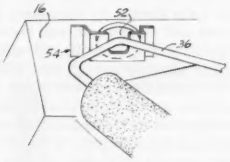
Filed July 19, 1973, Ser. No. 380,603

Int. Cl. B44d *3/12*

U.S. Cl. 401—121 **1 Claim**

1. In a paint tray for use with a paint roller or the like, said paint roller having a bent wire rod supporting a paint applying portion at one end and having a handle at the other end, said bent wire rod including a self standing paint roller button, said

paint tray including substantially coplanar front and rear edgs, a paint well adjacent to and extending vertically below said rear edge for storing a supply of paint, and an integral inclined surface tapering upwardly from said paint well to said front edge for rolling excess paint off said paint applying portion whereby excess paint flows into said well, the improvement comprising:



a small relatively thin support member secured to said paint tray, said support member having a flat base with a slot therein, said flat base spaced a slight distance from said paint tray, said slot for receiving a part of the wire rod of said paint roller with said self standing button positioned in the space between said flat base and said paint tray and with the wire rod and paint applying portion on the opposite side of said flat base for supporting and storing the paint applying portion of said roller above the paint well.

3,870,421

TUBULAR NIB-TYPE PEN WITH A SCREWED-IN NIB

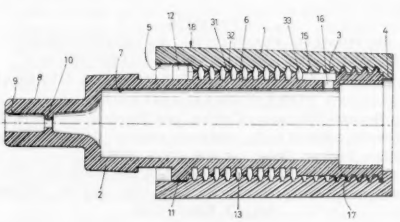
Otto Mutschler, Heidelberg, Germany, assignor to J. S. Staedtler, Nurnberg, Germany

Filed Dec. 1, 1972, Ser. No. 311,127

Claims priority, application Germany, Dec. 8, 1971, 2160835

Int. Cl. B43k *8/00*

U.S. Cl. 401—259 **3 Claims**



1. A tubular nib-type pen structure comprising in combination:

a hollow holding shank; and

a hollow tubular nib having a writing end and including a space constituting a reservoir for writing fluid, said nib being inserted into the shank with its writing end protruding from one end of the shank, said shank having an internal threading extending along substantially the entire length of the shank and said nib having at its other end an external threading engageable with the shank threading for releasably retaining the nib in the shank, said nib further having in and along its outer wall a helical groove axially separated from the threading on the other end of the nib by a gap and extending along and parallel to the threading on the shank, the positions of the shank threading and of the helical groove being correlated so that the valleys between the turns of the shank threading and the groove turns are in registry thereby forming a continuous venting channel along the major portions of the lengths of the shank and the nib, said channel terminating at one end at said gap in communication therewith said nib having at the other end of the venting channel an outwardly protruding shoulder and said holding shaft having a juxtaposed inner wall portion resting against said shoulder as a bearing, said nib shoulder including an opening therethrough connecting said other end of the venting channel with the atmosphere, a wall portion of the nib in said gap including a vent hole communicating with the reservoir in the nib, thereby constituting an equalization passage between the reservoir and the atmosphere.

3,870,422

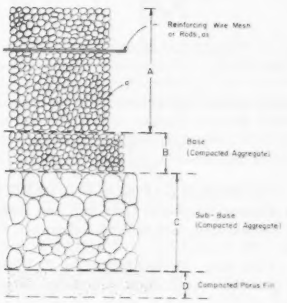
POROUS PAVEMENT

John J. Medico, Jr., Sarasota, Fla., assignor to Christine Medico, Sarasota, Fla.

Filed June 7, 1974, Ser. No. 477,431

Int. Cl. E01c *11/00*

U.S. Cl. 404—31 **9 Claims**



1. A pavement for ground surfaces, such as parking lots, roadways, etc. formed of a mixture of aggregates, cement and an admixture of water and an adhesive compatible with water and cement to form a compact surface having voids between the aggregates to provide a porous hard surface of pavement and allow water to percolate through the voids to the surface below the pavement.

3,870,423

COMPOSITE STONE ARRANGEMENT FOR PAVEMENTS

Josef Peitz, Jr., Rochusweg 4, 479 Paderborn, Germany

Filed July 17, 1973, Ser. No. 379,951

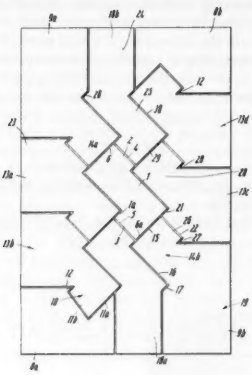
Claims priority, application Germany, Mar. 9, 1973, 7308973

Int. Cl. E01c *5/00*

U.S. Cl. 404—41 **5 Claims**

1. In a stone arrangement for composite pavements, a combination comprising at least one center stone having a substantially rectangular center piece, said center piece forming a pair of protrusions transversely spaced on opposite lateral sides of said center piece, and two lateral extensions disposed substantially at right angles to and at opposite sides of said center piece, each of said extensions having a front edge and a smaller and a larger lateral edge so that each lateral edge makes an oblique angle with the respective front edge, each of said extensions defining with said center piece a recess transversely spaced from said protrusions; and a plurality of neighboring border stones including first and second border stones which abut said center stone and one of which has a protrusion and a recess respectively extending into and receiving one of said recesses and one of said protrusions of said center stone, each of said border stones having a projection and a cutout, and the projection and cutout of each border stone respectively extending into and receiving the cutout and projection of the adjacent border stone, the area of each of said border stones exceeding the area of said center stone,

whereby the border stones are interlocked with respect to each other and with respect to said center stone so that tipping



of said border stones is prevented when exposed to unequal loading.

3,870,424

EXPANSION GAP SEALING DEVICE

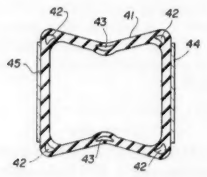
Waldemar Koester, Forsbach, Germany, and Reinhold Huber, Rorbas, Switzerland, assignors to Kober AG, Glarus, Switzerland

Filed Mar. 23, 1972, Ser. No. 237,287

Claims priority, application Germany, Sept. 7, 1971, 2144620

Int. Cl. E01c *11/12*

U.S. Cl. 404—67 **20 Claims**



1. A sealing device for an expansion gap between opposite surfaces of structural members, comprising a body of elastomeric material having cross wall means, side wall means, and joint means between said side wall means and said cross wall means to define a substantially closed body, a pair of stiff non-rubber connecting strips, only one surface of each connecting strip being vulcanized to a separate side wall means, whereby the other sides of said connecting strips are free of said body and connectable to said opposite surfaces, said cross wall means having foldably inclided wall portions, said joint means having cavities therein providing reduced joint wall thicknesses as compared with the wall thickness of said body outside of said joint means for facilitating the movement of said wall means relative to each other, said cavities having curvatures arranged so that cavities at diametrically opposite joints of said body are oppositely directed relative to each other, and wherein said joint means have double walls defining said cavities therebetween, said cavities having sickle-shaped cross sections, whereby the walls at each of said joint means may move relative to each other.

10. A sealing device for an expansion gap defined between opposite surfaces of structural members, comprising a body of elastomeric material including cross wall means, connecting strip means for securing said cross wall means to said opposite surfaces, and a vulcanized bond between said body of elastomeric material and a region of one side of said connecting strip means, said connecting strip means comprising a material, other than natural and synthetic rubber, which is compatible with said vulcanized bond, the region of the other side of said strip means opposite said region on said one side thereof being free of elastomeric material and being connectable to said opposite surfaces, and wherein said body of elastomeric material comprises folds formed by oppositely inclined wall portions in said cross wall means, side wall means, and junction means for interconnecting said side wall means with said cross wall means and adjacent ones of said wall portions to each other to form a substantially closed body, said junction means comprising joint means with cavities therein having sickle-shaped cross sections including a convex and a concave curvature for facilitating the movement of said wall means and wall portions relative to each other, said cavities reducing the wall thickness at the junction means as compared to the wall thickness outside said joint means, said cavities having curvatures arranged so that the curvatures of cavities at diametrically opposite points of said body are oppositely directed.

3,870,425

DRY SOIL PROCESS

George Peter Karonis, 1766 Hondo Rd., S. Port St. Lucie, Fla. 33452

Continuation-in-part of Ser. No. 249,679, May 1, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,400

Int. Cl. E01c *7/36*

U.S. Cl. 404—76 **7 Claims**

1. A method for stabilizing soil including the steps of:

a. forming a solution comprised of 1 part sodium methyl silicate and from 8½ parts to 44 parts of water,

b. applying the solution to soil in a dry state at from 0.25 of a gallon to 3 gallons per square yard of soil.

3,870,426

METHOD OF PROTECTING PAVEMENT FROM CORROSIVE SALTS AND AN IMPERMEABLE PAVEMENT MEMBRANE AND PAVEMENT OVERLAY FOR USE IN SAID METHOD

John Howard Kietzman, Golden, and Mario Peter Tocci, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 148,205, May 28, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,892

Int. Cl. E01c *19/00*

U.S. Cl. 404—82 **27 Claims**

17. A method of protecting a pavement from deterioration comprising:

applying to said pavement a membrane layer comprising about 4 to about 10 weight percent asbestos fibers, about 12 to about 20 weight percent asphalt and about 70 to about 84 weight percent of fine aggregate, said asbestos and said asphalt present in amounts to produce an asbestos fiber/asphalt ratio in the range of about 0.3 to about 0.5, said aggregate having a gradation such that at least about 70% by weight of said aggregate is capable of passing a No. 10 U.S. Standard Sieve Screen and at least about 10% by weight of said aggregate is capable of passing a No. 200 U.S. Standard Sieve screen;

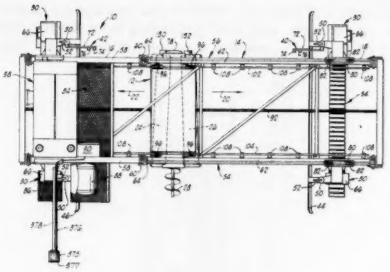
applying a layer of asphalt concrete wearing course over said membrane as a hot mix having a thickness and a temperature sufficient to heat said membrane layer to a temperature sufficiently high that upon compaction of the wearing course the membrane layer is rendered impermeable; and

applying a compaction force to said asphalt concrete wearing course, whereby said membrane layer is compacted and rendered impermeable to water.

3,870,427
SURFACE FINISHING METHOD AND APPARATUS

Thomas E. Allen, Mustank, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed July 26, 1972, Ser. No. 275,232
Int. Cl. E01c *19/28*
U.S. Cl. 404—103 28 Claims



1. Apparatus for moving hydrauljcally operated apparatus between predetermined positions and providing operating power fluid therefore, comprising:

a frame assembly extending generally between the predetermined positions;

a support frame for supporting the hydraulically operated apparatus, the support frame moveably supported on the frame assembly;

chain means, having opposite ends, drivingly supported on the frame assembly generally between the predetermined positions, the chain means being rotatable in a first rotating direction and in a second rotating direction, in a driven position of the chain means, one end of the chain means connected to one portion of the support frame and the opposite end of the chain means connected to one other portion of the support frame to move the support frame in one direction along the frame assembly in the first rotating direction of the chain means and to move the support frame in one other direction in the second rotating direction of the chain means;

chain drive means drivingly connected to a portion of the chain means to drive the chain means in the first rotating direction and in the second rotating direction;

hydraulic pump means responsive to the chain means and supported on a portion of the support frame to provide power fluid to the hydraulically operated apparatus supported thereon, in a driven position of the hydraulic pump means; and

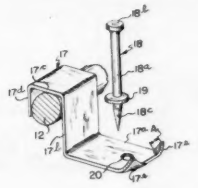
gear means in gearing engagement with the chain means and having a portion thereof drivingly connected to the hydraulic pump means to drive the hydraulic pump means in a driven position of the chain means in the first rotating direction and the second rotating direction thereof.

3,870,428
SECURING MEANS FOR CONCRETE REINFORCING BASKET

Jeffrey Mack Jackson, 24455 Lakeshore Blvd., Euclid, Ohio 44123

Continuation-in-part of Ser. No. 304,415, Nov. 7, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,883
Int. Cl. E01c *11/18*
U.S. Cl. 404—134 2 Claims

1. Means for securing a concrete reinforcing basket to a base of concrete or black asphalt or the like, wherein said basket comprises a rigidly connected assembly of spaced wires or rods including vertical spacers extending a predetermined spaced distance below said rods; said securing means comprising a plurality of spaced metal clips, each clip having a planar horizontal leg adapted to rest on said base and an integral upstanding leg at the laterally inner end of said horizontal leg and an integral hook inwardly extending at the upper end of said upstanding leg and having a downwardly opening bight of a size to snugly embrace a rod of said basket with the top of said bight at approximately said predetermined distance from the under side of said horizontal leg, said horizontal leg being

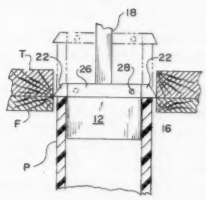


rectangular and the outer corners being turned up slightly in position to engage snugly a low velocity tool driving said pin, there being a hole through said horizontal leg concentric with said outer corners, said horizontal leg being long enough to receive the muzzle of a high velocity powder actuated gun between said hole and said upstanding leg, and adapted to receive a pin fastener means for securing said horizontal leg to said base.

3,870,429
APPARATUS FOR TRIMMING PLUMBING PIPES BELOW FLOOR LEVEL

Harold R. Lomax, 901 Cardinal Place, Thomasville, N.C. 27360, and Bobby K. Potts, R.F.D. 2, High Point, N.C. 27460

Division of Ser. No. 236,901, March 22, 1971, Pat. No. 3,799,688. This application Dec. 3, 1973, Ser. No. 421,156
Int. Cl. B23b *35/00*
U.S. Cl. 408—1 1 Claim

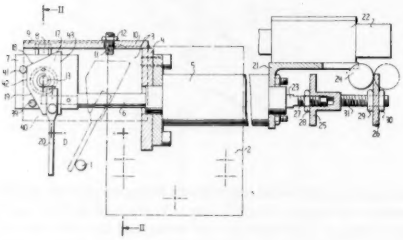


1. An improved method for preparing plastic bathroom plumbing pipe for the reception of a water closet wherein the pipe is first rough cut to a height above a finished floor level prior to the installation of the finished floor, said method further comprises trimming said pipe to a prescribed distance below the surface of the finished floor subsequent to the installation of the finished floor, whereby the final trimming operation comprises the steps of providing a rotary cutting tool having an exposed cutting edge approximately equal to the pipe wall thickness and a pilot extending from said cutting tool having a diameter substantially equal to the inside diameter of the pipe, inserting said pilot into the pipe with the cutting edge bearing against the exposed end of the pipe and rotating the cutting tool while pushing the tool longitudinally against the end of the pipe until a desired amount of pipe is removed, whereupon a portion of the pipe is removed cleanly and evenly to the prescribed distance below the surface of the finished floor without disturbing the finished floor around the pipe.

3,870,430
ARRANGEMENT FOR THE DETECTION, WITH A ROCKING FEELER, OF THE PRESENCE OF A PART

Rene Guenot, Sceaux, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 25, 1974, Ser. No. 445,812
Claims priority, application France, Mar. 29, 1973, 73.11404
Int. Cl. B23b *47/24*
U.S. Cl. 408—6 **8 Claims**



1. An arrangement for the detection of the presence of a part, such as for example, the tool of an automatic machine, comprising;

a framework;

a carriage movably supported upon said framework;

a feeler pivotably mounted upon said carriage and including means for contacting said tool part for pivoting said feeler;

means for driving said carriage and said feeler in a predetermined cyclical path so as to perform a detection operation;

a fixed stop means mounted upon said framework and disposed within said path whereupon said feeler detecting the presence of and contacting said tool part, said feeler will pivot so as to pass said fixed stop means and permit said carriage and said feeler to complete a first movement phase of said detection operation thereby indicating the presence of said part;

a unidirectional stop means fixedly mounted upon said carriage in abutting relationship with said feeler when said feeler is not pivoted and for cooperating with said fixed stop means so as to retain said feeler therebetween and prematurely arrest the movement of said carriage and said feeler when said feeler is not pivoted due to the absence of said tool part so as to thereby indicate the absence of said part; and

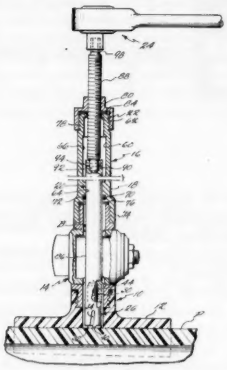
means for detecting the completion of said first phase of movement of said detection operation and for initiating a second movement phase of said operation for returning said feeler and said carriage to their initial positions.

3,870,431
CUTTER FOR PLASTIC PIPE AND DRILLING TOOL

Lawrence F. Luckenbill, and Daniel A. Ellis, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Dec. 18, 1973, Ser. No. 425,791
Int. Cl. B23b *47/18, 51/04*
U.S. Cl. 408—111 **30 Claims**

1. A rotatable cutter member for cutting a hole in a plastic pipe by cutting a coupon when the cutter member is positively advanced against the pipe a predetermined distance per rotation of the same, said cutter member comprising a cylindrically shaped metal hollow body member having an outside wall surface and an inside wall surface and a wall thickness sufficient to resist distortion during cutting of the hole in the plastic pipe and having a cutting end portion with a flat end surface along a substantial portion thereof being normal to a longitudinal axis of the body member and a shank end portion for attachment to a tool, said body member further having at least one slot in said wall extending in a generally lengthwise direction from said flat end surface, said slot having a leading face and a trailing face, as defined by direction of rotation of the cutter member, a tooth of short arcuate extent projecting from the flat end surface of the body member, said tooth having an outside wall surface, an inside wall surface, and a face in the direction of rotation of the cutter member which are continuations of said outside wall surface and said inside wall surface of said body member and said trailing face of said slot, respectively, said tooth projecting from the flat end surface of said body member a predetermined length being at



least as great as the predetermined distance of advancement per rotation whereby bearing between the flat end surface of the body member and the pipe is substantially eliminated to reduce torque and/or thrust loads, and said slot being positioned with at least one-half its width being located on one side of a diameter of said body with its trailing face parallel to a plane through the diameter so that said trailing face is inclined toward the interior of said body and an acute angle is formed at the exterior edge thereof, whereby said face of said tooth and said trailing face of said slot are oriented so that initial chips and then a continuous peeling chip are cut from the pipe, fed upwards in the slot, and inwardly into the hollow body member above the coupon.

3,870,432
TUBE WORKING TOOL

Richard V. Strybel, Elk Grove Village, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

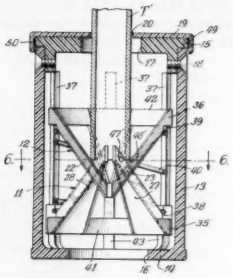
Filed Oct. 15, 1973, Ser. No. 406,308
Int. Cl. B23d *79/02;* **B23b** *5/16*
U.S. Cl. 408—191 **15 Claims**

1. A tool for concurrently reaming the inner edge of a cut tube end and deburring the outer edge of the cut tube end comprising:

a first cutter having an open conical arrangement of a plurality of equiangular conical segments spaced equiangularly apart to define alternating first cutter blades and first spaces;

a second cutter having a similar open conical arrangement of said plurality of equiangular conical segments spaced similarly equiangularly apart to define alternating second cutter blades and second cutter spaces, said cutter blades having sharp side edges, said second cutter being coaxially apposed to said first cutter with the large ends of the conical cutters outermost and offset from said first cutter about the common axis thereof to align said first cutter blades of said first cutter with said second spaces of said

second cutter, and said second cutter blades of said second cutter with said first spaces of said first cutter; and resilient means urging said cutters coaxially apart while permitting a tube end urged coaxially through the large end of either cutter into engagement with the inner surfaces of the cutter blades thereof to move said one cutter into interleaved relationship with the other cutter to a



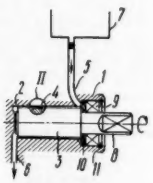
position wherein the inner edges of the cut end of the tube engages the cutter blades of said other cutter, whereby coaxial relative rotation between said tube end and said tool causes concurrent reaming of the inner edge of the cut tube end by said sharp side edges of said other cutter and deburring of the outer edge of the cut tube end by said sharp side edges of said one cutter.

3,870,433

WORM PUMP

Ivan Yakovlevich Raikov, ulitsa B. Galushkina; Pavel Andreevich Ivaschenko, ulitsa Glebovskaya 4, kv. 51, and Igor Vasilievich Samoilovsky, ulitsa B. Spasskava 1/2 korpus 2, kv. 9, all of Moscow, U.S.S.R.

Filed Aug. 30, 1973, Ser. No. 393,137
Int. Cl. F01d *5/00*
U.S. Cl. 415—72 **1 Claim**



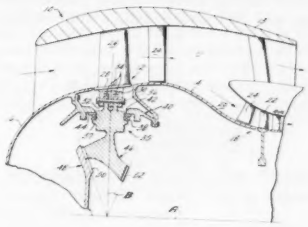
1. A worm pump comprising a body having a port; a screw conveyer disposed in said port of said body, said screw conveyor having a side face with at least one screw groove; two ducts extending from said port in the said body and disposed near the butt ends of said screw conveyor, one of said ducts communicating said port in said body with the source of the fluid being pumped, and the other duct communicating with the consumer; a screw groove made in the said screw conveyer, whose hydraulic diameter is less than 0.5 mm, said screw groove in said screw conveyer having the ratio between its width and depth ranging from 1 to 4, said hydraulic diameter being the ratio of four times the cross-sectional area divided by the wetted perimeter of the cross-section.

3,870,434

GEAR ARRANGEMENT FOR VARIABLE PITCH FAN

Elmir Edward Paulson, Topsfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 21, 1973, Ser. No. 427,377
Int. Cl. B63h *3/06*
U.S. Cl. 416—160 **7 Claims**



1. In a turbomachine of the type having plurality of spaced apart variable pitch blades, journalled in a rotable hub member, a gear arrangement comprising:

a plurality of spaced apart sector gears in respective driving engagement with the blades wherein each gear has a plurality of teeth spaced apart at varying distances along the length of a conical surface of revolution,

said sector gears arranged such that the spaced apart teeth of any two adjacent gears overlap without engaging each other, and

a unison bevel gear having a plurality of circumferentially spaced apart teeth in simultaneous driving engagement with the teeth of the sector gears.

3,870,435

VISUAL RECORDING METHOD AND MEANS

Akio Watanabe, and Yasuzo Murata, both of Hiratsuka, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of Ser. No. 53,054, July 7, 1970, abandoned. This application Sept. 19, 1972, Ser. No. 290,353
Claims priority, application Japan, July 9, 1969, 44-54399
Int. Cl. B41c *1/06*
U.S. Cl. 117—36.2 **7 Claims**

1. A visual recording method which comprises inscribing a record with an aqueous ink containing a color coupler having a chromatic appearance in the range of from colorless to lightly colored which is selected from the group consisting of ammonium metavanadate, sodium metavanadate, and vanadium pentoxide on a recording structure comprising a base structure provided over a surface thereof with a coated layer containing at least a dispersion of a fine white powder selected from the group consisting of calcium carbonate, silicon dioxide, talc, titanium dioxide, aluminum oxide and clay and a color developer which is at most only slightly soluble in water and is selected from the group consisting of lauryl gallate, stearyl dihydroxybenzoate, calcium dihydroxynaphthalenesulfonate, and 2-ethylhexylammonium dihydroxynapthalenesulfonate, which developer thereby reacts with said color coupler to form a visual record of strong color.

3,870,436

AIR RELEASE VALVE FOR SELF-PRIMING PUMPS

Dennis K. Remy, Galion, Ohio, assignor to The Gorman-Rupp Company, Mansfield, Ohio

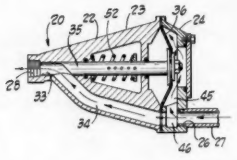
Filed Mar. 18, 1974, Ser. No. 451,794
Int. Cl. F04b *49/00*; **F16k** *31/12*
U.S. Cl. 417—299 **15 Claims**

1. In a pumping system including a self-priming pump having an inlet and an outlet, a check valve downstream from said outlet, and an air release valve operatively arranged between

said outlet and said check valve for permitting the flow of fluid therethrough when said check valve is closed, the improvement wherein said air release valve comprises:

a. a housing having an inlet port connected to said pump outlet, an outlet port communicating to exhaust, and a flow passage extending between said ports,

b. a valving plug reciprocally mounted in said housing for pressure responsive movement between a closed position in which an end portion of said plug extends into and blocks said flow passage and an open position in which



said end portion of said plug is withdrawn from said passage so as to permit unobstructed flow, and

c. actuating means for causing movement of said plug between said positions,

d. said actuating means including movable means mounted in said housing to define an expansible chamber communicating with one of said ports,

e. said movable means being connected to said plug at a location remote from said passage and said one end portion and being movable by pressure generated in said chamber to move said plug to one of said positions.

3,870,437

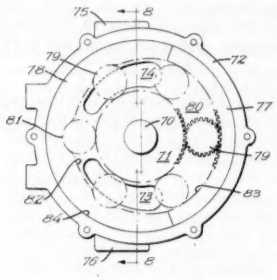
PLANETARY GEAR PUMP

John T. Gondek, Columbia Heights, Minneapolis, Minn.

Division of Ser. No. 267,560, June 29, 1972,. This application Nov. 21, 1973, Ser. No. 417,763

Int. Cl. F01c *5/00*; **F03c** *3/00*; **F04c** *5/00*

U.S. Cl. 417—310 **7 Claims**



1. A fluid pump comprising:

a generally cylindrical drive member adapted for rotation about its axis and having gear teeth about its circumference to form a sun gear;

a housing surrounding and supporting said drive member and having a flexible inner circumferential surface disposed at a varying distance from said generally cylindrical drive member so as to form a pumping chamber therebetween said inner surface having gear teeth thereon to form a ring gear;

inlet and outlet passageways in communication with said pumping chamber;

a plurality of generally rigid rolling members held between said drive member and said inner circumferential surface adapted to be rolled by said drive member about said inner surface and carry fluid through said pumping chamber from said inlet ports to said outlet ports said rolling members having gear teeth about their circumference to form planetary gears.

3,870,438

PUMP

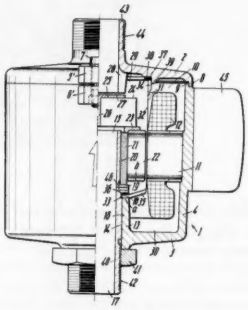
Paul Dannenmann, Welzheim, and Gunter Kratz, Plochingen, both of Germany, assignors to G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken, Stuttgart, Germany

Filed May 17, 1973, Ser. No. 361,048

Claims priority, application Germany, May 18, 1972, 2224213; May 8, 1973, 2323089

Int. Cl. F04b *17/00*

U.S. Cl. 417—356 **17 Claims**



1. In combination: a pump impeller and a drive motor therefor in coaxial adjacent relation, said motor comprising a stator and a tubular rotor, said impeller being drivingly connected to one end of said rotor, a common housing for said pump impeller and stator, a collimator sleeve extending axially along the inside of the stator and forming a fluid seal in the housing isolating the rotor and pump impeller from the stator, a fluid inlet in said housing leading into one end of said sleeve and a fluid outlet in said housing leading from the other end of said sleeve, a hollow shaft comprising a readily separable knock-out spindle interchangeably carried by said housing in centered accurate alignment therewith and secured against axial displacement extending axially into and rotatably supporting said rotor for quiet operation and being less susceptible to wear, said hollow shaft communicating with said fluid inlet and the discharge side of said pump impeller communicating with said fluid outlet, said housing having a generally radial shoulder thereon facing said rotor, and a substantially radial flange extending transversely of said knock-out spindle and located on one end of said sleeve only sealingly clamped engaging in a centered position against said shoulder.

3,870,439

HIGH PRESSURE PUMP FLUID END

John E. Stachowiak, and John B. Goss, both of Houston, Tex., assignors to American Aero Inc., Houston, Tex.

Filed Jan. 8, 1973, Ser. No. 321,757

Int. Cl. F04b *21/00*, *39/00*

U.S. Cl. 417—454 **4 Claims**

1. A high pressure pump fluid end, comprising,

a manifold block having both an inlet suction manifold and an outlet discharge manifold located therein,

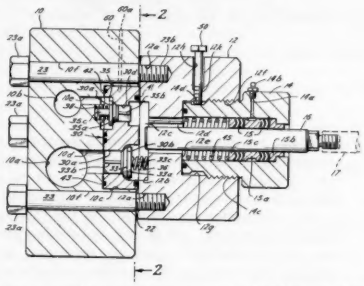
a pump cylinder mounted adjacent and perpendicular to said manifold block and having a plunger opening therein,

connector means releasably connecting said pump cylinder to said manifold block,

a pump plunger operably mounted in said pump cylinder for reciprocation in said opening,

said manifold block including a recessed valve cartridge cavity having communication with said inlet manifold, said outlet manifold and said plunger opening, said cavity being located at the interface between the block and the plunger opening, and being larger than the plunger opening and encompassing said plunger opening,

an integral replaceable generally oval valve cartridge disposed in said valve cartridge cavity and having a first valve means therein for permitting fluid flow from said inlet manifold into said plunger opening upon movement of said pump plunger in a direction away from said manifold block, and a second valve means therein for permitting fluid flow from said plunger opening to said outlet



discharge manifold upon movement of said pump plunger in a direction towards said manifold block,

said first and second valve means comprising wing guided valves situated wholly within the cartridge, mounted side by side and parallel to the axis of the pump plunger,

said cartridge positioned between the plunger opening and said manifold block, and extending outwardly beyond the depth of the cavity, and

an oval seal mounted in a groove in the cartridge and encircling said plunger opening for sealing between said pump cylinder and said valve cartridge whereby fluid pumped by said pump plunger is caused to exert peak fluid pressure directly on said cartridge and peak fluid pressure is isolated from said manifold block.

3,870,440

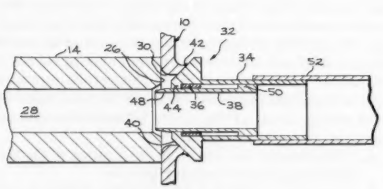
HERMETICALLY SEALED COMPRESSOR SUCTION TUBE ASSEMBLY

Edward A. Zuercher, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 11, 1974, Ser. No. 449,920

Int. Cl. F04b *17/00*

U.S. Cl. 418—248 **2 Claims**



1. A hermetic compressor unit comprising:

a casing including a side wall;

a compressor including a cylinder block positioned in said casing and having an outer surface adjacent the inner surface of said casing wall;

a suction passage in said block opening into said outer surface;

said casing having an opening aligned with and larger than said passage;

a suction tube connector having a reduced end portion extending into said opening in axial alignment with said suction passage;

a circumferentially disposed flange formed on the inner surface of said tube connector adjacent said reduced end portion;

a tubular ring member being of greater ductility than engaging parts arranged on said flange; and

a tubular fitting having an end portion press fit in said passage and a shoulder portion projecting over said flange for engaging and compressing said ring member between said flange and said shoulder to seal the casing and suction tube connector to the compressor cylinder block.

3,870,441

PRODUCTION OF POLYMERIC FOAM

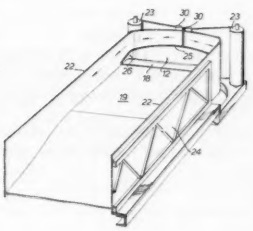
Nicholas George Petzetakis, Athens, Greece, assignor to Unifoam AG, Glarus, Switzerland

Filed Sept. 10, 1973, Ser. No. 395,607

Claims priority, application Great Britain, Sept. 11, 1972, 42008/72

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 C **8 Claims**



1. Apparatus for the continuous production of polymeric foam from a mixture of liquid foam reactants, comprising an open-topped vessel in which liquid foam reactants may expand upwardly, means for supplying liquid foam reactants to the bottom of said vessel, a weir structure associated with a forward portion of the rim of said vessel so that foam rising by expansion in said vessel will flow as partially-expanded foam over said weir structure, a channel-shaped conveyor associated with said weir structure and arranged continuously to convey partially-expanded foam away from said weir structure, the foam completing the expansion process within said channel-shaped conveyor, and means for assisting partially-expanded foam to flow over said weir structure comprising upward extensions of said vessel which are continuously movable around the whole rim of said vessel, except said forward portion, towards said weir.

3,870,442

APPARATUS FOR APPLYING REFRACTORY COVERING TO SKID RAIL

Frank W. Schaefer, 1678 Cory Dr., Dayton, Ohio 45406

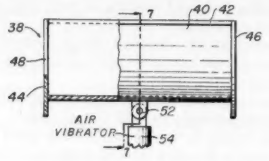
Division of Ser. No. 260,372, June 7, 1972,. This application July 19, 1974, Ser. No. 490,096

Int. Cl. B29c *5/00*

U.S. Cl. 425—117 **3 Claims**

1. A mold assembly especially adapted to casting coverings to the undersides of horizontally oriented members having anchoring structures projecting therefrom, comprising a relatively rigid form having a surface contoured to the desired configuration of the cast material, a flexible sheet placed

against said surface, means engaging said sheet for tying said sheet to the member on which the liner is to be cast, and



vibrator means connected to said form for vibrating said form while advancing said assembly toward said member.

3,870,443

HOT-PRESSING SYSTEM

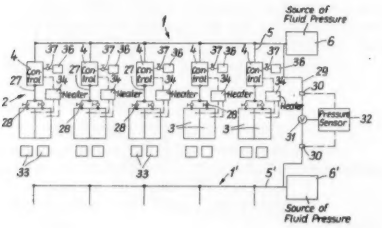
Oskar Schatz, Harburg-Neu-Leversen, Germany, assignor to Frid. Krupp Gesellschaft mit Beschrankter Hoftung, Essen, Germany

Filed Apr. 15, 1974, Ser. No. 461,140

Claims priority, application Germany, Apr. 17, 1973, 2319295

Int. Cl. B29h *5/02*

U.S. Cl. 425—28 R **16 Claims**



1. A hot-press system comprising:

a plurality of subsystems each including a pair of presses each having a frame, a first mold half carried on said frame, a pair of hydraulic cylinders carried on said frame to either side of a central plane thereof, and a second mold half carried on said cylinders, each subsystem futher including control means connected on one side to both of said presses for displacing the second mold halves thereof with the respective cylinders toward and away from the respective first mold halves; and

hydraulic actuating means including a common source of fluid pressure and conduits connected between said source and the other sides of each of said control means for hydraulic operation of each of said pairs of presses by the respective control means.

3,870,444

PLANT FOR PRODUCING WAX PATTERNS FOR USE IN INVESTMENT CASTING

Malachy Herron, Halesowen, England, assignor to British Leyland UK Limited, London, England

Filed Jan. 8, 1973, Ser. No. 321,676

Int. Cl. B29c *24/00*; **B22c** *7/02*

U.S. Cl. 425—143 **7 Claims**

1. A plant for use in producing a wax pattern for use in investment casting which comprises:

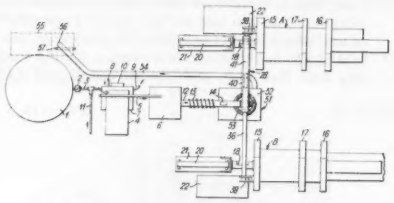
a. an extrusion press incorporating a die for the wax pattern to be produced;

b. a container for holding molten wax;

c. a machine supplied with molten wax from said container for forming said wax into a continuous extrusion of plastic wax having a circular cross-section of the same diameter as the die opening;

d. said machine having an outlet tube lying parallel to the line of action of the extrusion press and from which said extrusion of plastic wax issues;

e. a breech adjoining, and in alignment with, the die opening; and



f. a transfer mechanism comprising a heated transfer tube movable between a position in alignment with said outlet tube in which it receives from the outlet tube a substantially cylindrical wax billet having a volume at least equal to the volumetric capacity of the die, and a position within said breech, and means for moving said transfer tube laterally between said two positions, said breech being positioned to locate the billet coaxially with respect to the die opening preparatory to extrusion of the billet by the press from the breech to fill the die.

3,870,445

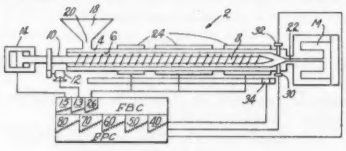
INJECTION MOLDING MACHINE CONTROLS

Peter Hold; Angelo J. Notte, both of Milford, and Marc A. Rizzi, Orange, all of Conn., assignors to USM Corporation, Boston, Mass.

Continuation of Ser. No. 326,877, Jan. 26, 1973, abandoned, which is a division of Ser. No. 194,280, Nov. 1, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,347

Int. Cl. B29f *1/06*, *1/08*

U.S. Cl. 425—144 **23 Claims**



1. A system for the adaptive control of a machine for injecting plasticated material into a mold, said machine having a heated barrel connected to the mold by a nozzle, means for inserting material into the barrel, a plasticating screw rotatably and slidably mounted in the barrel, and means, first, to rotate and retract said screw in order to plasticate the material and collect an amount thereof in front of the screw and, second, to force the plasticated material into the mold by a forward sliding thrust of the screw between charged and final positions, said system comprising:

A. a first monitor for detecting the position of the screw and generating a signal relative thereto;

B. a second monitor for detecting the sliding speed of the screw during injection and generating a signal relative thereto;

C. a third member for detecting the temperature of the plasticated material and generating a signal relative thereto;

D. means for setting predetermined standards for final screw position and for the temperature of the plasticated material and generating signals relative thereto;

E. means for receiving and analyzing the speed monitor signal, and generating a timing signal when said speed signal indicates that the screw has substantially stopped;
F. means for receiving and comparing the temperature monitor signal with the standard temperature signal, and generating a signal relative to the difference therein;
G. means responsive to the timing signal for receiving and comparing the position monitor signal and the standard final position signal and generating a signal relative to the difference therein;
H. means responsive to the position differential signal for adjusting the charged screw position on recharge an amount which tends to reduce the final position differential signal to zero;
I. a first regulator for adjusting the rotating speed of the screw during plastication;
J. a second regulator for adjusting the sliding force which is applied to the screw during plastication;
K. a third regulator for adjusting the supply of energy to the barrel heaters during plastication; and
L. a selector, responsive to the temperature differential signal, to selectively activate the regulators in a manner which tends to reduce said temperature differential signal to zero.

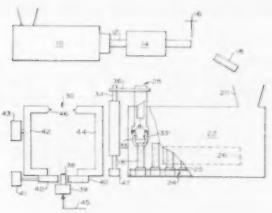
17. A system for the adaptive control of a machine for injecting plasticated material into a mold, said machine having a heated barrel connected to the mold by a nozzle, means for inserting material into the barrel, a plasticating screw rotatably and slidably mounted in the barrel, and means to, first, rotate and retract the screw in order to plasticate the material and collect an amount thereof in front of the screw, and, second, to force the plasticated material into the mold by a forward sliding thrust of the screw between charged and final positions, said system comprising:
A. a first monitor for detecting the position of the screw and generating a signal relative thereto;
B. a second monitor for detecting the sliding speed of the screw during injection and generating a signal relative thereto;
C. means for setting a predetermined standard for final screw position and generating a signal relative thereto;
D. means for receiving and analyzing the speed monitor signal, generating a first timing signal when said speed signal indicates that the mold is full, and generating a second timing signal when said speed signal indicates that the screw has substantially stopped;
E. means responsive to the second timing signal for receiving and comparing the position monitor signal and the standard final position signal and generating a signal relative to the difference therein;
F. means responsive to the position differential signal for adjusting the charged screw position on recharge an amount which tends to reduce the final position differential signal to zero;
G. means responsive to the first timing signal to adjust the forward pressure exerted by the screw during injection to a predetermined holding pressure level and to maintain said pressure level for a predetermined period; and
H. means for initiating resumption of the plasticating cycle, thereby retracting the screw to the charged position for subsequent injection cycling after the predetermined period has elapsed.

3,870,446
CLAMPING JAWS WITH OFFSET TINES FOR ALIGNMENT AND TRANSFER OF PARISONS

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 29, 1973, Ser. No. 375,126
Int. Cl. B28b *13/00*
U.S. Cl. 425—174.4 **6 Claims**

1. A parison transfer device comprising in combination: a first clamping jaw having a first and a second tine pointing forwardly and outwardly, a second clamping jaw having a first and second tine pointing forwardly and outwardly, a lower surface of said first tine of each jaw being offset above an upper surface of said second tine of each jaw, said first and second jaw means being disposed in opposed relationship such that on closing a first space is present between said lower

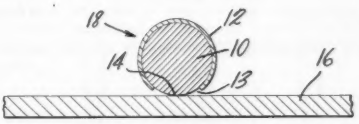


surface of said first tine of said first jaw and said upper surface of said second tine of said second jaw and a second space is present between an upper surface of said second tine of said first jaw and a lower surface of said first tine of said second jaw; means to close said clamping jaws; and means to move said clamping jaws axially and laterally.

3,870,447
SCRAPERS FOR PELLETIZING DISKS

Hans Skretting, Vagsbygd, and Ole Egeland, Kristiansand, both of Norway, assignors to Elkem-Skigerverket A/S, Oslo, Norway

Filed Apr. 10, 1974, Ser. No. 459,608
Claims priority, application Norway, Apr. 13, 1973, 1545/73
Int. Cl. B29c *1/00*
U.S. Cl. 425—225 **3 Claims**



1. In a pelletizing disk apparatus for the formation of pellets from finely divided material comprising a pelletizing disk and at least one scraper, the improvement comprising having the working edge of the scraper composed of a silicon carbide rod rigidly affixed in a surrounding tubular holder.

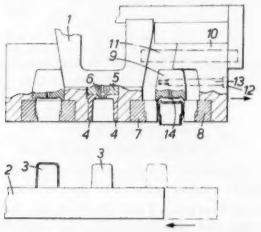
3,870,448
MACHINES FOR MOULDING HOLLOW BODIES FROM SYNTHETIC RESIN

Eric Desmond Thomas Majors, Chichester, and John Kenneth Davey, Clanfield, both of England, assignors to Cope Allman Plastics Limited, Farlington, Portsmouth, Hampshire, England

Filed Feb. 12, 1974, Ser. No. 441,871
Int. Cl. B29d *23/03*
U.S. Cl. 425—242 B **2 Claims**

1. A tool for moulding hollow articles, such as containers from thermoplastic synthetic resin material by a combined injection and blow molding process, said tool comprising first means defining an injection mold cavity having an axis, second means defining a blow mold cavity having an axis, said first and second means being disposed side by side with said axes mutually parallel, a first block supporting said first and second means, a second block, said blocks being movable relatively apart in a direction parallel to said axes, a core mounted on said second block, and extending parallel to said axes, said

core being movable laterally relative to said cavities between a position in which it is aligned with said injection mold cavity and a position in which it is aligned with said blow mold cavity, the invention lying in the feature that said second means comprise three mold sections, namely, a first mold section which is fixed in relation to said first block, and defines one side of said blow mold cavity, a second mold section defining the other side of said blow mold cavity, said second mold



section being movable towards and away from said first section in a direction perpendicular to said axes, a third section defining a base of said cavity, said third section being movable with respect to said first section in the same direction as said second section, means for moving said second section through a predetermined distance in said direction away from a closed position, and means for simultaneously moving said third section a lesser distance in the same direction.

3,870,449

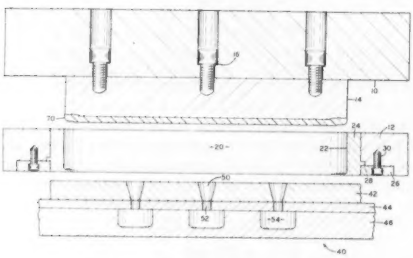
PERMANENT FLASHPAD FOR TRANSFER MOLDING

Jerry D. Stringfellow, Fort Smith, Ark., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed July 23, 1973, Ser. No. 381,843

Int. Cl. B29h *3/12*

U.S. Cl. 425—251 **5 Claims**



1. In a transfer molding press including a transfer ram having a substantially flat bottom surface, a transfer ram pot, a plate defining at least one mold cavity and a plate defining at least one sprue in open communication between the ram pot and the mold cavity, wherein the uncured charge material substantially fills the cavity and the sprue, the remainder of the charge material forming a flashpad of generally uniform thickness in the ram pot, the flashpad curing during the cure cycle and subsequently being scrapped, the improvement comprising:

a pad of polymeric material of generally uniform thickness of about 0.100 to about 0.200 inch (2.54 – 5.08 mm) and having higher durometer than the charge material at room temperature, said durometer being in the range of about 80 to about 90 on the Shore A scale, said pad being attached to the bottom surface of the transfer ram and extending over substantially the entire area thereof, and said pad being adapted to effectively seal against the surface of the transfer ram pot, thereby substantially preventing leakage of the charge material under pressure.

3,870,450

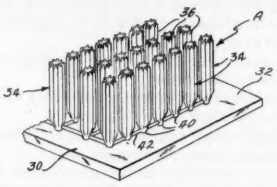
MULTICELLED STRUCTURE APPARATUS FOR MAKING SAME

Robert H. Graebe, 4 Signal Hill Blvd., Belleville, Ill. 62223

Filed May 16, 1973, Ser. No. 360,743

Int. Cl. B29c *13/00*

U.S. Cl. 425—269 **14 Claims**



1. An apparatus for producing from an initially fluent material a cushioning device having flexible inflatable cells formed integral with and projecting outwardly from an intervening layer, said apparatus comprising: a base member and mandrels projecting outwardly from the base member such that each of the mandrels except those mandrels located at the periphery of the base is surrounded by other mandrels, the base member having an intervening surface extended between the mandrels with that surface being substantially continuous and substantially free of voids, the mandrels being fluted along their sides to form grooves and ribs with the longitudinal axes of the grooves and ribs for each mandrel being at a steep angle with respect to the portion of the intervening surface surrounding that mandrel whereby, when the mandrels and intervening surface are coated with the initially fluent material and that material is allowed to solidify, the cushioning device is formed with the shape of the flexible cells being determined by the mandrels and the shape of the intervening layer being determined by the intervening surface on the base.

3,870,451

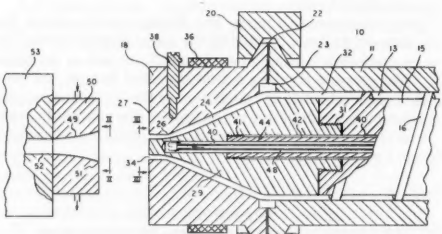
APPARATUS FOR EXTRUDING FOAMED THERMOPLASTIC MATERIAL

Cem M. Gokcen, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 30, 1973, Ser. No. 355,766

Int. Cl. B29f *3/08*

U.S. Cl. 425—378 R **8 Claims**



1. A structure for producing a foamed thermoplastic product comprising an extruder, a die structure attached to the outlet end of said extruder and in fluid communication therewith, a plasticizing screw rotatably disposed within said extruder, the improvement comprising:

a mandrel secured to the downstream end of said screw to rotate therewith,

said mandrel extending into and to the outlet end of said die structure and cooperating therewith to form an outlet orifice,

said screw and mandrel defining a generally toroidal shaped melt flow passageway of substantially uniform thickness from the downstream end of the screw to the outlet of the die structure and having at least a portion of decreasing cross-sectional area.

3,870,452

APPARATUS FOR THE PRODUCTION OF AN ARTICLE FROM THERMOPLASTIC SYNTHETIC PLASTIC, USING BLOWING, INJECTION AND BLOWING OR FOIL BLOWING PROCESS

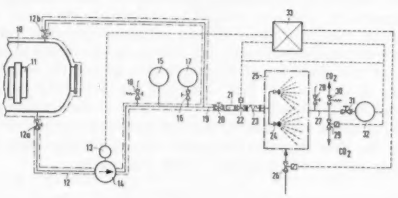
Karl Frank, 8, Lohhohl, Linz/Rhineland, Germany

Division of Ser. No. 221,793, Jan. 28, 1972, Pat. No. 3,783,157, which is a continuation of Ser. No. 868,672, Oct. 21, 1969, abandoned. This application Nov. 8, 1973, Ser. No. 413,892

Claims priority, application Germany, Oct. 24, 1968, 1805011; Dec. 23, 1968, 1816771; May 22, 1969, 1926275

Int. Cl. B29d *23/03*

U.S. Cl. 425—387 B **21 Claims**



1. Apparatus for the production of an article from synthetic thermoplastic material comprising:

a mold having a cavity therein;

a source of liquid coolant;

a neck forming pin attached to said mold, said pin being provided with at least one duct which opens into said cavity;

a ring pipe connected at each end to said coolant source, said ring pipe including a pipe union which branches off therefrom;

a liquid circulating and pressurizing pump connected with said ring pipe and being operable to circulate and pressurize liquid coolant carried by said ring pipe;

a first shut-off valve provided in said pipe union;

a flexible pipe conduit providing fluid communication between said neck forming pin and said first shut-off valve; thermal insulation provided for said coolant source, said ring pipe, said pump, said union, said first shut-off valve and said flexible pipe conduit;

a coolant outlet pipe provided within said mold whereby coolant may be exhausted from said mold cavity;

an outlet pipe shut-off valve connected with said outlet pipe;

a pair of safety valves connected with said outlet pipe; and the cross sectional area of said pipe union and said flexible pipe progressively decreasing from said coolant source to said at least one duct.

3,870,453

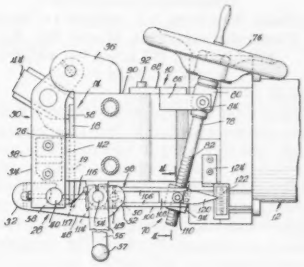
ADJUSTMENT MECHANISM FOR AN EXTRUDER DIE

Walter B. Howard, Lima, Ohio, assignor to National-Standard Company, Lima, Ohio

Filed Oct. 15, 1973, Ser. No. 406,185

Int. Cl. A01j *21/00, 25/12;* **B28b** *21/52*

U.S. Cl. 425—465 **6 Claims**



1. An adjustment mechanism for use with an extruder having a die supporting means for supporting a two-plate die at the discharge outlet of said extruder with one plate held stationary and the other disposed in a sliding relation toward and away from said one plate, the opposing marginal edge of said plates defining a die opening whose width dimension varies by sliding displacement of said other plates, comprising a die plate displacement means for controlling the position of said other die plate relative to said one die plate, setting means operatively connected to said die plate displacement means for effecting movement of said other die plate to selectively set the width of said die opening, gauge means for providing a visual indication of the amount of displacement of said other die plate, said gauge means comprising an elongated incremental scale mounted on said extruder and a pointer operatively connected to said setting means in a manner to traverse across said scale in proportion to displacement of said other die plate.

3,870,454

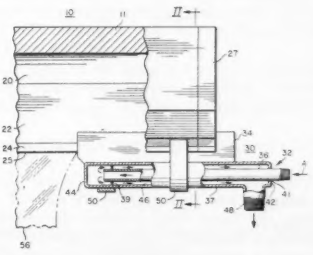
COOLED DECKLE FOR DIE STRUCTURE

William R. Penrod, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 1, 1973, Ser. No. 328,517

Int. Cl. B29f *3/04, 3/08*

U.S. Cl. 425—466 **8 Claims**



1. In a die structure having an outlet slot for extruding plastic therethrough, deckle means for controlling the width of plastic exiting from said slot, said deckle means comprising: a deckle member associated with said die structure to block a portion of said outlet slot,

means to cool said deckle member, including means for bringing a cooling fluid into thermal contact with said deckle member to increase the viscosity of the plastic to prevent leakage through the blocked portion of the die.

3,870,455

METHOD FOR CATALYTICALLY SUPPORTED THERMAL COMBUSTION

Saul G. Hindin, Mendham, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,096
Int. Cl. F23d *3/40*
U.S. Cl. 431—7 **6 Claims**

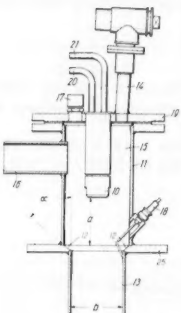
1. A method for the catalytically supported thermal combustion of carbonaceous fuel to form an effluent of high thermal energy said fuel being in vaporous form and intimately admixed with air; said combustion being under essentially adiabatic conditions and being characterized by said fuel-air admixture having an adiabatic flame temperature such that upon contact with said catalyst, the operating temperature of said catalyst is substantially above the instantaneous auto-ignition temperature of said fuel-air admixture but below a temperature that would result in any substantial formation of oxides of nitrogen comprising: contacting said fuel-air admixture with an oxidation catalyst having a surface area of at least 20 m^2/g after calcination for 2 hours at 1,200°C. consisting essentially of (a) a catalytically-active, calcined composite of alumina, ceria, and chromia and (b) a catalytically-effective amount of platinum group metal added thereto after calcination of said composite at a temperature of at least 850°C.

3,870,456

BURNER FOR THE STOICHIOMETRIC COMBUSTION

Johannes W. Graat, Overasselt, Netherlands, assignor to Smit Nymegen B.V., Nymegen, Netherlands

Filed May 10, 1973, Ser. No. 359,197
Int. Cl. F23b *7/00*
U.S. Cl. 431—8 **11 Claims**



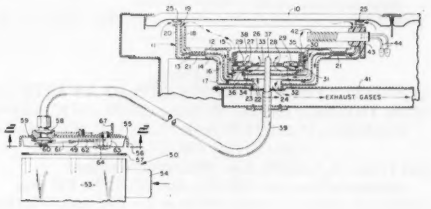
1. A method for the combustion of liquid fuel such as fuel oil or diesel oil with air comprising the steps of: mechanically atomizing the liquid fuel, directing the atomized medium tangentially to the mechanically atomized fuel within an atomizing passage, directing combustion air coaxially and in the same direction as the flow of said atomized fuel and medium, and contracting the combustion air and atomized fuel and medium by at least 10 percent before burning on a contracting wall to mix the combustion air and atomized air and atomized fuel and medium without settling of atomized fuel on said contracting wall.

3,870,457

BLUE FLAME GAS SMOOTH TOP RANGE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Continuation of Ser. No. 223,451, Feb. 4, 1972, abandoned.
This application Jan. 11, 1974, Ser. No. 432,547
Int. Cl. F23h *5/00*
U.S. Cl. 431—66 **18 Claims**



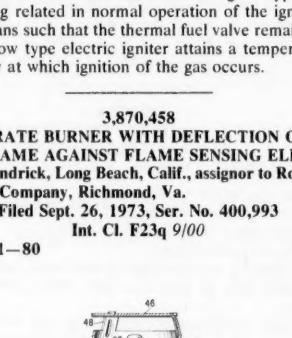
1. Ignition and control means for a gas burner, comprising a glow type electric igniter the wattage of which is not less than about fifty watts, a thermal fuel valve having a heat responsive actuator and an electric heater means for heating said heat responsive actuator, the glow type electric igniter adapted to be positioned adjacent the burner port area and the thermal fuel valve being in the gaseous fuel supply line to the same, circuit means for electrically connecting in series circuit relation the glow type electric igniter and the thermal fuel valve electric heater means, and means for pre-adjusting the thermal fuel valve heat responsive actuator to determine the response thereof while in at least simulated operating condition with the thermal fuel valve electric heater means in such circuit relation to the glow type electric igniter, the response times of the thermal fuel valve and the glow type electric igniter being related in normal operation of the ignition and control means such that the thermal fuel valve remains closed until the glow type electric igniter attains a temperature approximately at which ignition of the gas occurs.

3,870,458

PLURAL RATE BURNER WITH DEFLECTION OF HIGH RATE FLAME AGAINST FLAME SENSING ELEMENT

Fred W. Hendrick, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 26, 1973, Ser. No. 400,993
Int. Cl. F23q *9/00*
U.S. Cl. 431—80 **9 Claims**



1. A burner apparatus for operating at both high and low rates comprising

a burner member having a chamber, an inlet communicating with the chamber, and an outer peripheral section with a plurality of first ports for projecting burning gas outward from the burner member at the high rate of

operation and upward from the burner member at the low rate of operation;

a flame sensing element above the burner member in the path of upward burning gas at the low rate of operation; said outer peripheral section of the burner member having a second port for projecting burning gas outward at the high rate of operation; and

means spaced outwardly from the outer peripheral section of the burner member in the path of outward-projected burning gas from the second port for deflecting outward projected burning gas from the second port upward to a direction impinging upon the flame sensing element.

3,870,459

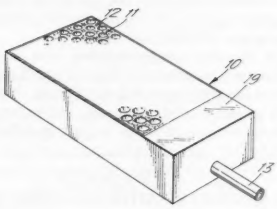
BURNER FOR USE WITH FLUID FUELS

Denis Henry Desty, Weybridge; Barry Herbert Francis Whyman, Teddington, and David Montagu Whitehead, Camberley, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 866,481, Oct. 15, 1969, abandoned. This application Nov. 12, 1973, Ser. No. 415,074

Int. Cl. F23d *13/12*

U.S. Cl. 431—328 **10 Claims**



1. A diffusion flame burner for fluid fuels which comprises a fuel chamber having a fluid-tight bottom portion defining an air inlet zone, a top portion defining a combustion zone, and a fluid-tight side portion between said bottom portion and said top portion, said fuel chamber being open to the atmosphere only at its said top portion and being divided into upper and lower fuel zones, metal sponge having a pore size of 0.1 to 0.5 mm average diameter packed in said upper fuel zone for controlling the flow of fuel therethrough towards the combustion zone, said metal sponge being exposed to the atmosphere and unobstructed at its upper surface, said lower fuel zone constituting a fuel inlet zone adapted to be connected to a fuel supply and said upper packed fuel zone constituting a fuel outlet zone adjacent to and communicating with said combustion zone, and a plurality of combustion air tubes passing through said fuel chamber from said bottom portion to said top portion for conducting primary combustion air through said chamber from said air inlet zone to substantially the entire area of the surface of said fuel outlet zone adjacent to and communicating with said combustion zone in confined streams out of contact with fuel in said chamber, whereby, during the use of the burner primary combustion air flows through the combustion air tubes into the combustion zone where it reacts with the fuel which flows upwardly and through said fuel outlet zone into the combustion zone thereabove, said fuel and said primary combustion air mixing only in said combustion zone by low velocity diffusion, and the resulting fuel-air mixture burning as a diffusion flame in said combustion zone, the bore of each of said combustion air tubes being 0.01–1.0 cm^2 where it opens into the combustion zone and the bores of the tubes accounting for at least 25 percent of the surface of said fuel outlet space adjacent to the combustion zone.

3,870,460

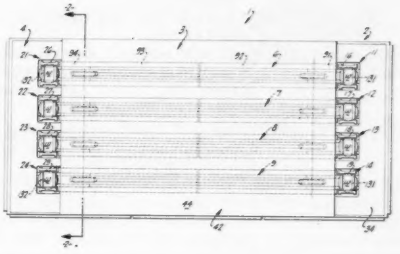
SINGLE OR MULTI-TRACK FLUID BEARING HEATING APPARATUS AND METHOD

Alan G. Flint, San Jose, Calif., assignor to GCA Corporation, Bedford, Mass.

Filed Apr. 3, 1974, Ser. No. 457,432

Int. Cl. F27b *9/14*

U.S. Cl. 432—11 **37 Claims**



1. Apparatus for transporting articles, such as semiconductor wafers, past a treating station, comprising

A. infeed means at an infeed station for introducing articles in sequence into said apparatus,

B. means at a station adjacent said infeed station for treating articles presented thereto,

C. conveyor track means for receiving articles in sequence from said infeed means and presenting the same in spaced sequence to said treating station, comprising

1. directional fluid bearing structure on which articles are supported and by which the articles are positively moved from said infeed station to and past said treating station,

2. an endless pacer belt having article spacers carried thereon for maintaining articles spaced during transport past said treating station and for pacing movement of such articles by restricting movement thereof under controlled conditions as the articles are supported and moved by said fluid bearing structure, and

3. mechanism for positively driving said belt in accordance with a predetermined rate schedule, and

D. means at a discharge station for receiving articles in sequence after the same have passed from said treating station.

18. A method of transporting articles to and past a treating station, comprising

A. introducing articles in spaced sequence onto a fluid bearing structure,

B. introducing directional article supporting fluid through said fluid bearing structure and supporting said articles thereon while the same are moved by said article supporting fluid past said treating station,

C. while said articles are supported by and moved on said supporting fluid positively restricting their movement to pace the rate of travel thereof past said treating station, and

D. discharging treated articles in spaced sequence from said treating station.

3,870,461

FLAME TREATING OF PAPERBOARD AND METHOD THEREFOR

Walter G. Wise, P.O. Box 27066, Indianapolis, Ind. 46227

Filed Feb. 5, 1974, Ser. No. 440,083

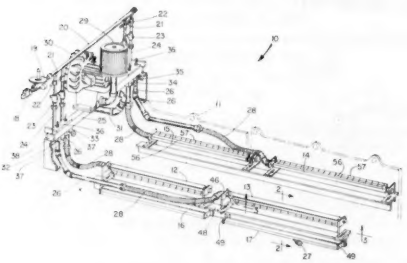
Int. Cl. F27b *9/14*

U.S. Cl. 432—11 **15 Claims**

6. A method of flame treating paperboard while preventing scorching thereof comprising the steps of:

providing an elongated tube with length and outlets along said length;

forcing a gas/air mixture from said outlets under sufficient pressure to produce a first intense, continuous flame extending said length when ignited;



pre-mixing sufficient air with said gas prior to said forcing step to insure complete combustion of the gas; and,

igniting said mixture to produce a flame with length;

directing said flame toward and adjacent a paperboard to directly heat said paperboard with said flame while said paperboard moves along said length of said flame.

3,870,462

FURNACE FOR DIRECT NON-OXIDIZING HEATING OF MATERIAL UNDER THERMAL TREATMENT

Nikolai Nikolaevich Semenov, Vorobievskoe shosse, 2b, kv. 1; Lev Abramovich Gussak, Leninsky prospekt, 57, kv. 86; Vasily Konstantinovich Bobolev, Vorobievskoe shosse, 11, kv. 36; Evgeny Pavlovich Unxov, Rusakovskaya naberezhnaya, 6, kv. 95; Anatoly Alexandrovich Astafiev, Sharikopodshipnikovskaya ulitsa, 4, kv. 34; Mikhail Semenovich Khazanov, Festivalnaya ulitsa, 14, korpus 3, kv. 67; Vitaly Iosifovich Moroz, Sharikopodshipnikovskaya ulitsa, 2a, kv. 76, all of Moscow; Mark Alexandrovich Severov, ulitsa Gromova, 8, kv. 30, Leningrad; Roman Stepanovich Kuleshov, ulitsa Pugacheva, 9, kv. 65, Leningrad; Vladimir Konstantinovich Levitsky, ulitsa Detskaya, 11, kv. 28, Leningrad; Dmitry Petrovich Yakushev, ulitsa Sedova, 29, kv. 19, Leningrad; Gennady Demyanovich Rudkov, prospekt Obukhovskoi Oborony, 35, kv. 16, Leningrad; Ivan Petrovich Zubov, Sharikopodshipnikovskaya ulitsa, 2a, kv. 59, Moscow; Viktor Vasilievich Afanasiev, Sharikopodshipnikovskaya ulitsa, 4, kv. 159, Moscow; Vladimir Vasilievich Yakovlev, Nagatinskaya naberezhnaya, 22, kv. 172, Moscow; Leonid Sememovich Baranovsky, 1 Vladimirovskaya ulitsa, 27, kv. 28, Moscow, and Margarita Borisovna Koroleva, derevnya Sobolikha, 8, Zheleznodorozhnv Moskovskoi oblast, all of U.S.S.R.

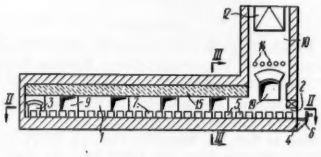
Filed Nov. 20, 1973, Ser. No. 417,512

Int. Cl. F27b *9/14, 3/22*

U.S. Cl. 432—72 **8 Claims**

1. A furnace for directing non-oxidized heating of material under thermal treatment, comprising an elongated working chamber formed by elongated opposed side walls and relatively short end walls, a hearth, a crown above the hearth, and having an opening for charging said material under thermal treatment onto said hearth and an opening for discharging said material from said hearth;

means for primary burning of fuel spaced along one of said side walls and directly across said elongated working chamber toward the other opposed side wall; gas outflow openings in the other opposed side wall in substantially opposed relation to the means for primary burning of fuel;



a gas-escape channel located behind and parallel to said other opposed side wall of the elongated work chamber and communicating with the gas outflow openings, said gas outflow openings being of a height substantially equal to the height of said chamber;

a second chamber communicating with said gas-escape channel for secondary burning of combustion products received from the gas outflow opening through the gas-escape channel; and means for secondary burning of combustion products in the second chamber.

3,870,463

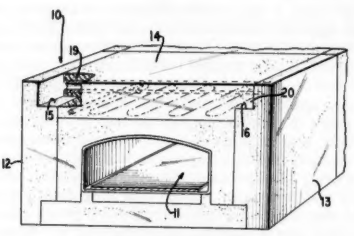
IN-SITU MOLDED REINFORCED FURNACE PANELS

Ewald R. Werych, Elm Grove, Wis., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Mar. 27, 1974, Ser. No. 455,336

Int. Cl. F23m *5/00*

U.S. Cl. 432—247 **8 Claims**



1. In an industrial furnace and the like having a heating chamber enclosed by side walls, a top insulating wall element positioned across said side walls comprising heating element means embedded in said top insulating wall element in heating relationship to said heating chamber and reinforcing means embedded in said top insulating wall means above said heating element means coextensive with the breadth of said top wall element.

3,870,464

PROCESS FOR TANNING WITH A MULTIVALENT METAL AND AN ORGANIC COMPOUND

Philip Stanley Briggs, Leeds, England, assignor to National Research Development Corporation, London, England

Filed July 23, 1971, Ser. No. 165,725

Claims priority, application Great Britain, July 24, 1970, 35994/70The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl. C14c *3/04*

U.S. Cl. 8—94.26 **31 Claims**

1. A process for the tanning of a hide or skin which comprises firstly treating the hide or skin with a basic tanning salt of a multivalent metal, secondly treating the hide or skin with an organic compound having a long chain aliphatic group while maintaining alkaline pH conditions during such treatment said compound having at least one reactive group capable of entering into a metal complex with the basic tanning salt of a multivalent metal, and thirdly treating the hide or skin with a salt of a multivalent metal at an acid pH.

22. A leather tanned with a basic tanning salt of a multivalent metal and containing on adsorbed complex of an organic compound, having a long chain aliphatic group and a single reactive group, and a salt of a multivalent metal, said leather being produced by the process of claim **1.**

3,870,465

PROCESS AND DEVICE FOR THE QUANTITATIVE ANALYSIS OF FREE LIME

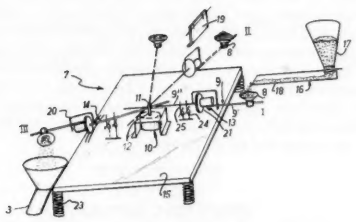
Claude Marechal, Lozanne, France, assignor to Ciments Lafarge S.A., Paris, France

Filed Nov. 29, 1972, Ser. No. 310,218

Claims priority, application France, Dec. 8, 1971, 71.44017

Int. Cl. G01n *33/38, 33/42*

U.S. Cl. 23—230 A **12 Claims**



1. A method of controlling at least one operating parameter of a kiln adapted to subject a product containing free lime to a heat treatment, comprising the steps of:

crushing the heat treated product issuing from the kiln to obtain a powderous substance; sampling at substantially regular time intervals successive amounts of said powderous substance, said sampling step being carried out by filling at said substantially regular intervals of time a calibrated receptacle with said powderous substance so as to obtain therein successive measured amounts of said substance;

introducing said measured amounts successively into a container while simultaneously introducing into the latter measured amounts of a reagent adapted to allow the free lime content of said powderous substance to be determined by analysis;

quantitatively analyzing the mixture of powderous substance and reagent thus obtained in said container so as to determine the free lime content of said powderous substance in said container;

producing a signal representing the free lime content thus determined; and

transmitting said signal to an appliance associated to said kiln and adapted to determine said at least one operating parameter of said kiln in response to said signal.

3,870,466

METHOD AND APPARATUS FOR AUTOMATIC TITRATION

Werner Rellstab, Steg, and Hans Steiner, Greifensee, both of Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland

Filed Jan. 15, 1973, Ser. No. 323,971

Claims priority, application Switzerland, Feb. 1, 1972, 1472/72

Int. Cl. B01k *3/00;* **G01n** *31/16*

U.S. Cl. 23—230 R **22 Claims**

1. A method for the automatic titration of a specimen to be tested, comprising the steps of discontinuously supplying in individual amounts to the specimen a constituent which causes a reaction with the specimen, determining the variation in time in the value of an electrical measurement parameter characterizing the condition of the specimen, and supplying a respective next individual amount of said constituent only after the variation in time in the value of said electrical measurement parameter has entered a preselected range.

3,870,467

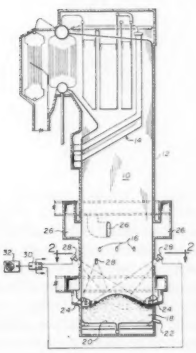
MONITORING CHEMICAL RECOVERY FURNACE

Hugh Wharton Nelson, West Hartford, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Apr. 23, 1973, Ser. No. 353,828

Int. Cl. G01j *3/30;* **G01n** *31/12*

U.S. Cl. 23—230 R **4 Claims**

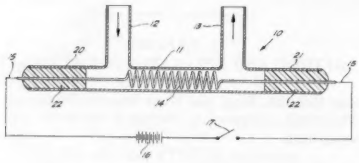


1. A method of monitoring the reduction efficiency in a chemical recovery furnace in which Na_2SO_4 is reduced to Na_2S in a char bed in said furnace and in which sodium gas is produced and burned to form Na_2O fume comprising the step of monitoring the intensity of only that portion of the visible light spectrum in the region of the wave length characteristic of excited sodium atoms coming from said char bed.

3,870,468
NITROGEN DIOXIDE ANALYSIS

Radhakrishna M. Neti, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 16, 1972, Ser. No. 263,543
Int. Cl. G01n *31/12*; **H05b** *3/10*
U.S. Cl. 23—232 R **10 Claims**

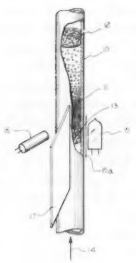


1. A method of treating nitrogen dioxide comprising:
passing said nitrogen dioxide through a small, confined volume containing a catalytic agent selected from the group of vitreous carbon, and a carbon and ceramic mixture, and
applying heat to said confined volume to heat said nitrogen dioxide to a temperature in the range of from 200°–600°C. whereby the nitrogen dioxide is substantially fully converted to nitric oxide during application of said heat.

3,870,469
APPARATUS AND METHOD FOR MONITORING THE PRESENCE OF VOLATILE ORGANIC LEAD COMPOUNDS

Alfred O. Walker, Lake Jackson, Tex., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Apr. 30, 1973, Ser. No. 355,594
Int. Cl. G01n *21/00*, *33/00*; **G08b** *21/00*
U.S. Cl. 23—232 E **4 Claims**

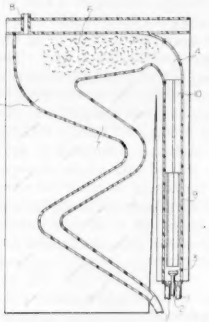


1. Apparatus for continuously monitoring the presence of volatile organic lead compounds in an atmosphere and automatically producing a signal when a predetermined amount of lead compounds is detected therein which comprises, a tube of light transmitting material, iodine crystals in said tube, means causing the iodine crystals in said tube to be exposed to the atmosphere to be monitored by driving a stream of air from the atmosphere through the tube, a photo-optical sensor adjacent said tube sensing a predetermined color caused by lead iodide developing on the inner surface of the tube, said photo-optical sensor including a light source positioned adjacent the tube in the area of the crystals, a photocell positioned adjacent the tube in the area of the crystals and relative the tube axis about ninety degrees from the light source to receive scattered light from the lead iodide if it develops said predetermined color, and means preventing direct illumination of the photocell from the light source, and alarm means driven by said sensor and triggered when the crystals are subjected to a predetermined amount of lead compounds to cause said predetermined color to produce said signal.

3,870,470
BUBBLE-TYPE BLOOD OXYGENATOR WITH BAFFLES

Fumitake Yoshida, and Norio Ohshima, both of Kyoto, Japan, assignors to Fumitake Yoshida, Kyoto, Japan

Continuation of Ser. No. 162,043, July 13, 1971, abandoned. This application June 18, 1973, Ser. No. 371,266
Claims priority, application Japan, July 24, 1970, 45-64376
Int. Cl. A61m *31/00*; **A61f** *7/00*
U.S. Cl. 23—258.5 **8 Claims**



8. In a bubble-type blood oxygenator having a blood inlet, an oxygen inlet, an oxygenated-blood outlet disposed for passing oxygenated-blood to a defoaming section and a gas disengaging section, the improvement which consists essentially of an elongated tubular oxygenating chamber having a vertical longitudinal axis, a baffle positioned within said oxygenating chamber, said baffle having superposed flat disks joined by an axially positioned hollow cylinder having a temperature-controlled liquid inlet channel and a temperature-controlled liquid outlet channel, said hollow cylinder defining a heat exchange member, said disks each having a plurality of perforations and being horizontally positioned within said chamber, said blood and oxygen inlet being at a lower end of the chamber, said oxygen inlet having an oxygen disperser connected thereto, and said outlet for oxygenated blood being at the upper end of the chamber.

3,870,471
DISSOLVING APPARATUS

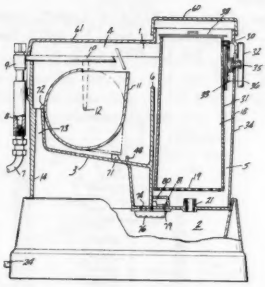
Joseph J. Tepas, Jr., Easton, Conn., and Arlon G. Sangster, Sterling, Mass., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 394,007, Sept. 4, 1973,. This application Jan. 28, 1974, Ser. No. 437,077
Int. Cl. B01d *11/02*; **B01f** *1/00*
U.S. Cl. 23—267 E **15 Claims**

1. In an apparatus for dissolving and dispensing soluble solid material including in combination a closed container having an upper chamber and a lower chamber and at least one partition separating said chambers, said upper chamber having a first and a second compartment separated by a divider; an inlet for liquid in the upper part of said first compartment, a rotary receptacle in said first compartment and attachment means therefore comprising a pair of trunnions, said receptacle receiving said liquid from said inlet and upon rotation periodically emptying said receptacle; first flow control means associated with at least one opening for controlling liquid flow between said first compartment and said second compartment; a magazine in said second compartment to hold soluble solids, said magazine having a pervious lower end permitting said liquid to contact the lower portion of said solids, at least

one opening for liquid flow between said second compartment and said lower chamber, an outlet in said lower chamber and second flow control means for liquid flow through said outlet, the improvement which comprises said magazine having vertical adjustment means comprising:

a. a bracket attached to and spaced apart from a wall of said magazine,



b. a an eccentric cam having the configuration of a continuous curve housed in said bracket,

c. a rotary member engaging said cam,

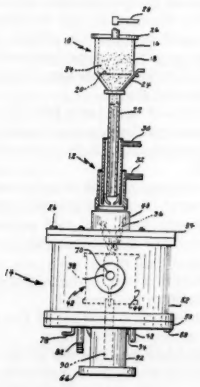
d. said cam frictionally engaging said bracket on said wall of said magazine and upon rotation of said rotary member to control said dissolving of said soluble solids by adjusting the height of said magazine in contact with said liquid.

3,870,472

METHOD AND APPARATUS FOR GROWING CRYSTALS BY ANNEALING THE CRYSTAL AFTER FORMATION

Joseph A. Adamski, 468 Central St., Framingham, Mass. 01701; Joseph R. Weiner, 49 Cedar St., Marblehead, Mass. 01945, and Girard H. Lavoie, 12 So. Main, Suncook, N.H. 03275

Filed Nov. 26, 1969, Ser. No. 880,000
Int. Cl. B01j *17/22*
U.S. Cl. 23—273 SP **2 Claims**



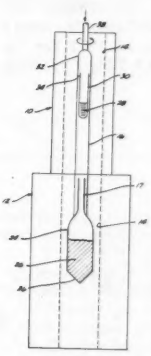
1. A method for simultaneously growing and annealing a fracture-free monocrystalline body in a crystal-growing zone which includes a high temperature flame, and an elongated chamber having a crystal-growing surface positioned within said chamber in axial alignment with said flame, which comprises the steps of: passing a flow of powdered oxide material through the high temperature flame to fuse said material, directing said flame and fused material toward the crystal-growing surface, depositing and accumulating said fused material onto said growing surface at a temperature and for a time sufficient to grow a monocrystalline body thereon while simultaneously lowering said growing body at a rate sufficient to maintain a predetermined distance between the flame and the top portion of the growing body, continuing to lower the growing body while simultaneously providing additional heat to the crystal-growing zone to achieve a predetermined temperature therein, maintaining and controlling said predetermined temperature for a time sufficient to attain the simultaneous growth and anneal of a monocrystalline body of desired length, stopping said powder flow, continuing to lower said grown monocrystalline body onto said crystal-growing zone while simultaneously maintaining said predetermined temperature annealing environment, simultaneously stopping said crystal movement and said flame while continuing to maintain said grown crystal in said predetermined temperature annealing environment, cooling said crystal to complete said anneal by reducing said predetermined temperature to room temperature slowly at a programmed rate, and removing the grown and annealed crystal from said growing zone.

3,870,473

TANDEM FURNACE CRYSTAL GROWING DEVICE

Nanse R. Kyle, Long Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 69,025, Sept. 2, 1970, abandoned. This application Oct. 30, 1972, Ser. No. 302,317
Int. Cl. B01j *17/26*
U.S. Cl. 23—273 SP **4 Claims**



1. An apparatus for obtaining desired conductivity type and carrier concentration in semiconductor crystal compounds selected from one of the II–VI, III–V, and IV–VI Groups of the Periodic Table of Elements comprising:

a pair of furnace means placed in tandem and having central opening means extending therethrough, each of said furnace means having means for providing elongated isothermal temperature portions of specified lengths and for providing a decreasing temperature gradient terminating the first of the isothermal temperature portions and passing through the crystallization temperature of the selected compound;

means for positioning a crystal growth tube in and moving said tube through said central opening means, said tube comprising first and second sections and means for attaching said sections together,

said first section having means for containing the selected Group compound, said first section being placeable within and movable through the first of the isothermal

temperature portions and the decreasing temperature gradient by said positioning and moving means, and

said second section having means for containing one constituent of the selected Group compound, said second section being placeable within and movable only within the second of the isothermal temperature portions by said positioning and moving means said first and second containing means having a specified distance therebetween, the length of the second isothermal temperature portion being at least as long as the combined length of the first isothermal temperature portion and the decreasing temperature gradient and being at least as long as the specified distance between said first and second containing means, and the said containing means of said second tube section remaining within the second isothermal temperature portion when the containing means of said first tube section moves through the first isothermal temperature portion and the decreasing temperature gradient.

4. A crystal growth tube closed from the external environment for use in synthesizing crystal materials comprising:

a first section for nucleating the crystal materials;

a second section for receiving at least some materials to be nucleated and spaced from and physically above said first section;

spacing means separating said first and second sections; and means for defining a barrier secured to the interior of said tube within said spacing means, intermediate said first and second tube sections, and opening towards said second section for collecting refluxed material.

3,870,474

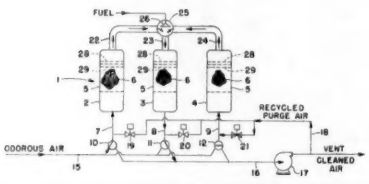
REGENERATIVE INCINERATOR SYSTEMS FOR WASTE GASES

Reagan Houston, 146 Curtis Dr., Avon Lake, Ohio 44012

Filed Nov. 13, 1972, Ser. No. 305,997

Int. Cl. F23g 7/06; B01j 9/02

U.S. Cl. 23—277 C **20 Claims**



1. A regenerative incinerator system comprising a plurality of regenerators each containing packing material, directing means for alternately directing the contaminated air or gas through said regenerators first in one direction and then in the reverse direction to purify the contaminated air and transfer heat from the packing material to the air and vice versa, a combustion chamber common to all of said regenerators for receiving the air passing from one regenerator to another to assure complete oxidation of the contaminants in the air prior to being discharged from the system, and purging means for purging said regenerators of any contaminated air remaining in said regenerators when the flow of air through said regenerators is reversed and reintroducing such purged air back into said combustion chamber to remove the contaminants from the purged air prior to being discharged from the system.

3,870,475

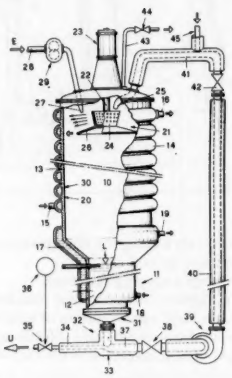
APPARATUS FOR THE CONTINUOUS PERFORMANCE OF CHEMICAL PROCESSES, MORE PARTICULARY ESTERIFICATION, AND/OR TRANSESTERIFICATION AND POLYCONDENSATION PROCESSES

Francesco Siclari; Cesano Maderno; Franco Magnoni, and Sergio Fulmini, all of Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Division of Ser. No. 813,914, April 7, 1969, Pat. No. 3,787,481. This application Sept. 18, 1972, Ser. No. 289,949

Int. Cl. B01j 1/00, 4/00

U.S. Cl. 23—285 **4 Claims**



1. Apparatus for continuously performing chemical and physical processes and reactions conducive to the formation and treatment of liquid intermediates with concurrent production of volatile coproducts of the reaction, such as esterification, transesterification and polycondensation processes forming the initial and intermediate stages of methods for the production of polyesters in a continuous run, comprising

a reactor having a metal peripheral wall whose inner face is vertical at least in the upper and middle portions of the reactor and which defines a chamber with a vertical axis, means for circulating a fluid thermal medium in contact with the external surface of said wall to heat said wall,

a shaft rotatably mounted in said reactor with the axis of said shaft coaxial with the axis of said chamber,

a vessel having a perforated perimetrical wall secured to said shaft at a first level in the upper part of said chamber to rotate with said shaft,

a disc secured to said vessel at a lower level than said first level and forming a flange around said vessel, said flange extending substantially radially outwardly from said perimetrical wall,

means for introducing into the reactor a reagent liquid said introducing means being located between said inner face of said peripheral wall and said perimetrical wall and positioned to cause said reagent liquid to drop onto the upper surface of said disc,

means for removing a reacted liquid product continuously from the bottom of said reactor,

means for withdrawing a portion of the removed reacted product for subsequent treatment,

means for recirculating to the top of the reactor and into said vessel at a point closer to said shaft than the point at which the reagent liquid is delivered onto said disc the remaining portion of the removed reacted product, and

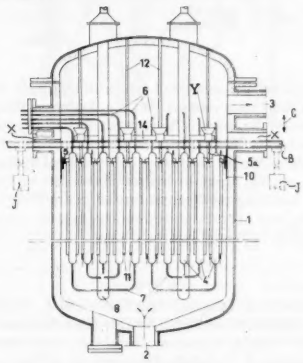
means for rotating said shaft and said vessel and said disc therewith so that the recirculated reacted liquid product is thrown through the perforations in said vessel wall onto the inner face of said reactor wall and the reagent liquid is hurled by said disc also against said inner face but at a

level lower than that which the recirculated liquid product is projected against said inner face so that the reagent liquid is dispersed into a liquid film formed by the recirculated liquid product on said inner face and the two liquids flow downwardly together on said inner face mingling and absorbing the heat therefrom.

3,870,476
DEVICE FOR PERFORMING CATALYTIC ENDOTHERMIC REACTIONS

Hans-Dieter Marsch, Wandweg 9, Dortmund-Ospel, Germany

Continuation-in-part of Ser. No. 179,788, Sept. 13, 1971, abandoned. This application Aug. 9, 1973, Ser. No. 386,942
Claims priority, application Germany, Nov. 11, 1970, 2055439
Int. Cl. B01j *9/04*
U.S. Cl. 23—289 **6 Claims**



1. A device for the reforming of gaseous hydrocarbons mixed with steam by a heating gas, said hydrocarbons and heating gas being under pressure of more than 5 atm.g. comprising in combination

a vertically disposed internally insulated pressure vessel,

a supporting plate in the upper portion of said vessel in essentially gastight connection with the inner insulated wall thereof, said supporting plate having a plurality of apertures,

heating gas inlet and outlet means for said vessel,

open ended shell tubes fitting said supporting plate apertures respectively, and seal welded therein to be supported by said plate, and having their lower ends disposed in the lower part of said vessel,

a catalyst-containing reaction tube in each shell tube and spaced from the walls thereof to enable passage of heating gas therethrough,

means for supporting said reaction tubes on said supporting plate and within said shell tubes,

catalyst-free gas feed tubes extending to the upper inlet ends of said reaction tubes, and

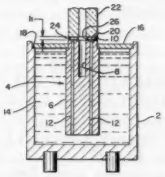
catalyst-free gas discharge tubes connected to the lower ends of said reaction tubes.

3,870,477
OPTICAL CONTROL OF CRYSTAL GROWTH

Harold E. Labelle, Jr., Quincy, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed July 10, 1972, Ser. No. 269,985
Int. Cl. B01j *17/00*
U.S. Cl. 23—301 SP **10 Claims**

1. In a method of growing a crystalline body of a selected material so that said body has a selected cross-sectional shape for an indefinite distance along its length, said method comprising growing and pulling said crystalline body from a growth pool of melt which is replenished via a capillary member by action of capillary rise from a reservoir supply of melt, said growth pool of melt also being characterized by a vertical meniscus which extends between the interface thereof with said crystalline body and an edge of said capillary member, the improvement comprising:



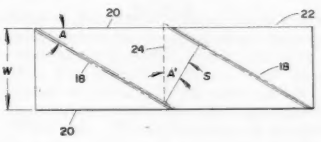
optically monitoring and measuring the height of said meniscus; and

adjusting as required the speed at which said body is being pulled or the temperature of said growth pool of melt so as to maintain the height of said meniscus within predetermined limits, whereby to cause said body to grow with a cross-section of substantially constant size.

3,870,478
METHOD OF PREPARING A BIAS FABRIC

Raymond A. Rohlfing, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Continuation of Ser. No. 57,378, July 17, 1970, abandoned. This application July 19, 1972, Ser. No. 273,089
Int. Cl. B26d *3/16*
U.S. Cl. 29—2.1 **3 Claims**



1. A method of precluding occurrence of more than one selvage across the width of a strip of bias fabric comprising the steps of:

helically cutting a length of flatly and generally squarely woven tubular fabric having two diametrically opposed and substantially parallel selvages, at least twice at a helical angle less than forty-five degrees and forming strips of bias fabric having cut widths such that the cut widths of the strips of bias fabric is less than the ratio of the selvage spacing to the cosine of the helical angle whereby only one selvage occurs across the bias fabric width at any point along the strip of bias fabric.

3,870,479
LITHOGRAPHIC TYPE DIFFUSION TRANSFER DEVELOPER

Kikuo Kubotera; Shinpei Ikenoue; Eiichi Mizuki, all of Saitama, and Tadahiro Fujiwara, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1972, Ser. No. 297,559
Claims priority, application Japan, Oct. 15, 1971, 46-81378
Int. Cl. G03c *5/30*
U.S. Cl. 96—29 L **19 Claims**

1. A lithographic type diffusion transfer developer for use in the diffusion transfer developing of a light-sensitive silver halide material, which consists essentially of at least one of ascorbic acid, an ascorbic acid derivative or a water-soluble alkali salt thereof in a developer containing as the developing agent 1-phenyl-3-pyrazolidone-polyhydroxybenzene or p-

aminophenol-polyhydroxybenzene, the developer further including a silver complexing agent, sulfite or alkali bromide being present in the developer in an amount of 0–1g per one liter of the developer, said developer providing a fringe-free half tone dot photographic original plate directly from an original, and providing increased sensitivity at the positive image portion of an image receiving layer when used in diffusion transfer development.

SN6

3,870,480

PROCESS AND APPARATUS FOR THE PRODUCTION OF COMBUSTIBLE GASES

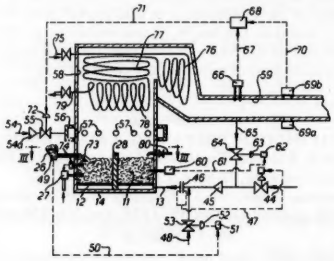
Gerald Moss, Oxford, England, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 15, 1972, Ser. No. 234,764

Claims priority, application Great Britain, Mar. 19, 1971, 7310/71

Int. Cl. C10j *3/16*

U.S. Cl. 48—71 **21 Claims**



6. A method of producing a substantially sulfur-free combustible gas from a solid carbonaceous material selected from the group consisting of coal, lignite, peat and shale and mixtures thereof, which comprises reacting said carbonaceous material in the upstream region of a reactor bed of fluidized particles containing at least one alkaline earth metal oxide at a temperature of between about 800°C. and 1,025°C. with an oxygen-containing gas having an oxygen content of between about 20 percent and 50 percent of the amount required for stoichiometric combustion of said carbonaceous material to convert said carbonaceous material to a substantially sulfur-free combustible gas and combining the sulfur in said carbonaceous material with the alkaline earth metal of said particles to form alkaline earth metal sulfides, transferring said particles from a downstream region of said reactor bed to a regenerator bed wherein said transferred particles are reacted at a temperature in the range of about 1000° to 1100°C. with an oxygen-containing gas to thereby convert the alkaline earth metal sulfides to alkaline earth metal oxides with the concurrent evolution of sulfur dioxide, returning said particles from said regenerator to the upstream region of said reactor bed, introducting a hydrocarbon oil in the said downstream region of said reactor bed and introducing steam in the oxygen-containing gas entering at least upstream of the region of said oil introduction.

3,870,481

METHOD FOR PRODUCTION OF SYNTHETIC NATURAL GAS FROM CRUDE OIL

William P. Hegarty, 31 Fairway Ln., Wescoville, Pa. 18106

Filed Oct. 12, 1972, Ser. No. 297,012

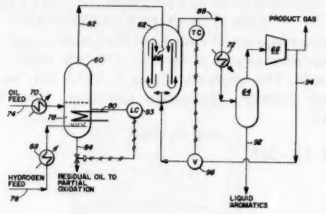
Int. Cl. C01b *2/16*

U.S. Cl. 48—213 **19 Claims**

14. A method of gasifying a crude oil to produce a gaseous effluent consisting essentially of hydrogen, methane, ethane, hydrogen sulfide and uncondensed aromatics comprising the steps of:

introducing a liquid crude oil into a vaporization vessel heated to between 800° and 1000°F;

maintaining a pool of liquid residual crude oil in said vaporization vessel and introducing warmed gaseous hydrogen into the pool of liquid residual crude oil thereby forming a mixture of vaporized hydrogen and crude oil above the pool of liquid residual crude oil; and



withdrawing the vaporized crude oil hydrogen mixture and injecting said mixture into a hydrogasification vessel wherein the mixture is recirculated at a temperature of about 1400°F to cause the mixture to react to form a gasifier effluent consisting essentially of hydrogen, methane, ethane, aromatic hydrocarbons and hydrogen sulfide and lowering the temperature of said effluent and recovering heat thereby thus condensing and separating condensible aromatic hydrocarbons.

3,870,482

PROCESS FOR THE SEPARATION OF C_4 ACETYLENIC HYDROCARBONS FROM GAS STREAMS

David G. Walker, Baytown; Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, all of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sept. 19, 1973, Ser. No. 398,678

Int. Cl. B01d *53/04*

U.S. Cl. 55—62 **14 Claims**

1. In the process for the separation of diacetylene and vinylacetylene from a hydrocarbon pyrolysis gas that contains from 1 to 10 mole percent of said compounds wherein said hydrocarbon pyrolysis gas is passed through a bed of activated carbon until the surface of the carbon is saturated with adsorbed C_4 acetylenic hydrocarbons and a stream of inert gas is passed through the bed of saturated activated carbon thereby desorbing said acetylenic hydrocarbons and forming a gas stream that contains about 30 to 50 mole percent of C_4 acetylenic hydrocarbons in said inert gas, the improvement that comprises saturating the surface of the activated carbon with an inert, non-explosive compound that has carbon adsorption characteristics similar to those of diacetylene and vinylacetylene and thereafter cooling said activated carbon before the hydrocarbon pyrolysis gas is passed into the bed of activated carbon.

3,870,483

SEPARATING ARRANGEMENT

Bo Ritzler, Sodertalje, Sweden, assignor to AB Filtrator, Sodertalje, Sweden

Filed Aug. 22, 1973, Ser. No. 390,610

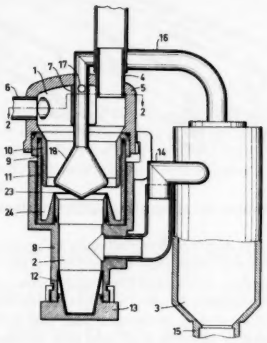
Claims priority, application Sweden, Aug. 23, 1972, 10957/72

Int. Cl. A61c *17/04*

U.S. Cl. 55—192 **20 Claims**

1. Arrangement for separating into components a fluid comprising at least one component and solid material particles, characterized in that an upper and a lower means of essentially cylindrical shape enclose one upper and one lower part, respectively, of a first liquid, whereby the cavity defined by the lower cylindrical means has a smaller radius than that

of the upper one; that an annular pocket is provided around the lower cylindrical means and below the upper one, the upper end of said pocket being terminated by a capillary slot arranged around the upper cylindrical means; that the pocket contains a second liquid having higher specific gravity than that of the first liquid, a boundary surface formed between said first and second liquids having essentially the shape of a frustrum of a funnel between the lower edge of the upper cylindrical means and the upper edge of the lower cylindrical means due to the capillary influence which the capillary slot



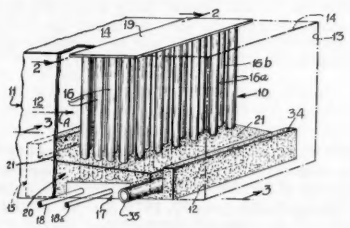
has on the second liquid, said capillary slot being arranged around the upper cylindrical means whereby, at separation, said particles together with the liquid form components of said fluid are forced by influence of the gravity to move downwards through said first liquid towards the funnel-shaped boundary surface between said first and said second liquids, whereby heavier particles will penetrate the boundary surface and collect in said pocket, whereas lighter particles together with the liquid form components of the fluid will slide along the funnel-shaped boundary surface and down into the lower cylindrically shaped part of said first liquid.

3,870,484

INDUSTRIAL SCRUBBER

Roy E. Berg, Ft. Lauderdale, Fla., assignor to Interstate Utilities Corporation, Miami, Fla.

Filed June 13, 1972, Ser. No. 262,317
Int. Cl. B01d *45/10*
U.S. Cl. 55—229 **5 Claims**



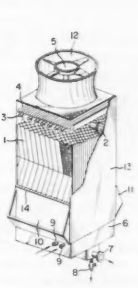
1. A scrubber for removing solid particulate and gaseous pollutants from a gas stream as said stream is circulated and conveyed therethrough, said scrubber comprising: a support base having associated therewith parallel side walls and a removable top defining a passage for the flow of a hot waste gas stream therethrough; a plurality of vertical, scrubber tubes; means for independently and removable mounting the lower ends of said scrubber tubes in said support base to provide parallel rows of said tubes in direct communication with a water supply in said base, each row being offset from each adjacent row such that said scrubber tubes are arranged in a staggered relationship transverse to the direction of flow of a gas stream to be circulated and conveyed therethrough; means for pumping water upwardly through said scrubber tubes such that the water is forced out of the tops thereof and is permitted to flow and cascade down and about their outer surfaces; said base further comprising supplemental means at the lower portion of said scrubber for engaging and supporting said tubes and for removing contaminated water containing solid particulate and gaseous pollutants from the scrubber, individually detachable spacing and securing means at the upper ends of said tubes, and said removable top comprising a plate member in closely spaced relation to the upper ends of said scrubber tubes, said plate member resting on said spacing and securing means to apply downward pressure to said tubes and serving to deflect water from the tops of said scrubber tubes downwardly between and about the outer surfaces thereof.

3,870,485

COOLING TOWER

Hiroo Shiraishi, Fukuoka; Hiroyoshi Kurohara, Chikushi; Shinjiro Tomita, Fukuoka; Senji Takenaka; Nobuo Yamada, both of Yokohama, and Motoyoshi Hashitani, Niiza, all of Japan, assignors to Japan Gasoline Co., Ltd.; Shin-Nihon Reiki Co., Ltd., both of Tokyo; Aza-yunohara and Oaze-Futsuk-aichi, both of Chikushino-shi, Fukuoka-ken,, Japan

Filed Nov. 9, 1972, Ser. No. 305,126
Claims priority, application Japan, Mar. 6, 1972, 47-22373; Mar. 22, 1972, 47-28670
Int. Cl. B01f *3/04*
U.S. Cl. 55—257 **5 Claims**



1. A cooling tower comprising a casing having side wall means with air inlet opening means for atmospheric air near the lower end thereof, said casing having outlet opening means at its upper end for discharging heated air; a basin disposed below said casing for receiving cooled liquid therefrom; an air-moving impeller associated with said outlet opening means for drawing air into said casing through said inlet opening means and discharging the air through said outlet opening means; gas-liquid contact means comprising a plurality of generally upright porous sheet-like screens each having an undulating configuration, said screens being arranged in association with each other to define upright passages for flow of upwardly rising air which air is adapted to contact liquid flowing downwardly on the screens; a plurality of liquid distributors mounted inside said casing between the upper ends of said screens and said outlet opening means, said liquid distributors being arranged in a generally horizontal array for distributing liquid substantially uniformly onto the upper ends of said screens, each liquid distributor comprising an elongated outer tube which is closed at both its axial ends and which has a series of axially spaced openings of essentially the same size along its lower side for discharging liquid substantially vertically downwardly onto the upper ends of the screens, an elongated inner tube fixed to and projecting

through one axial end of said outer tube and extending axially therein substantially to the other axial end of said outer tube, said inner tube being radially spaced from the interior wall of said outer tube to define therewith an annular zone for holding a quantity of the liquid, the axial end of said inner tube disposed within said outer tube being closed and the other axial end of said inner tube being connected to a source of the liquid, the portion of said inner tube located within said outer tube having a series of axially spaced openings along its upper side, so that liquid supplied to said inner tube overflows therefrom upwardly through said openings in said inner tube and then flows downwardly in said annular zone and accumulates to a substantial depth therein and the liquid flows downwardly through the openings in said outer tube under substantially uniform pressure along the entire length of said outer tube and onto the upper ends of said screens; and eliminator means mounted in said casing above said liquid distributors for minimizing the flow of splash liquid through said outlet opening means.

3,870,486

FLOOR SURFACE TREATING APPARATUS

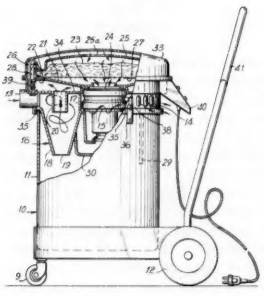
Bolik Anders Gottfrid Eriksson, Johanneshov; Erik Karl Gustav Johansson, Sollentuna, and Milos Vukotic, Tumba, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sept. 19, 1973, Ser. No. 398,846

Claims priority, application Sweden, Sept. 22, 1972, 12242/72

Int. Cl. B01d *45/16*

U.S. Cl. 55—276 **7 Claims**



1. A floor surface treating apparatus comprising a container having an upper part provided with an inlet opening for dust-laden air or liquid and discharge opening for clean air and a lower part for collecting separated dust or separated liquid, a generally vertically disposed cyclone separator in said container operatively connected to said inlet opening, at least one motor-fan unit in said container for moving air through said container, a relatively flat filter extending substantially across the entire width of the upper part of said container, means supporting said filter above both said separator and said motor-fan unit; said support means comprise means forming a housing around said filter; and said housing having an air inlet above said filter and air outlet below said filter, and said support means further forms a passageway from said separator to the inlet of said housing whereby air leaving said separator follows said passageway to the inlet of said housing and then flows through said filter and said housings outlet to the inlet of said motor-fan unit and subsequently to said discharge opening for clean air, and said separator being provided with a dust and liquid outlet communicating with said lower part of said container.

3,870,487

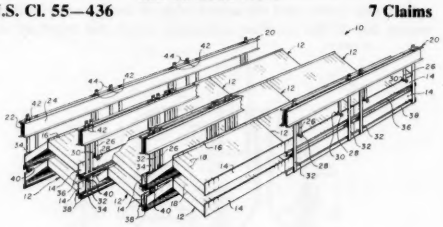
MODULE SUSPENSION SYSTEM

William Barrett Hurlbut, Sr., East Hartford; Preston Dean Liebig, West Hartford, and Gerald Maurin, Newington, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed June 28, 1972, Ser. No. 266,852

Int. Cl. B01d *45/08*

U.S. Cl. 55—436 **7 Claims**



1. An apparatus for supporting vertically stacked modules comprising:

a horizontally disposed longitudinally extending support;

a first vertically extending support integrally attached to and extending downward from said horizontal support;

a second vertically extending support removably supported from and extending downward from said horizontal support a greater distance than said first vertical support;

first retaining means mounted on said first vertical support at a first vertical elevation from said horizontal support; second retaining means mounted on said second vertical support at a second vertical elevation from said horizontal support, said second vertical elevation being vertically below said first vertical elevation;

a first resting surface means mounted on said second vertical support at a third vertical elevation from said horizontal support, said third vertical elevation being vertically between said first and second vertical elevations;

a second resting surface means mounted on said second vertical support at a fourth vertical elevation from said horizontal support, said fourth vertical elevation being vertically below said second vertical elevation;

said first retaining means and first resting surface means forming a first holding assembly and said second retaining means and second resting surface means forming a second holding assembly vertically below said first holding assembly, said holding assemblies each supporting at least one of the modules between its respective retaining means and resting surface means; and

said second vertical support being detachable from said horizontal support to vertically move said first resting surface means relative to said first retaining means to release said module supported therebetween.

3,870,488

LIQUID ELIMINATOR

Frederick W. Arndt, and Joseph H. Gavin, both of Bay Village, Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

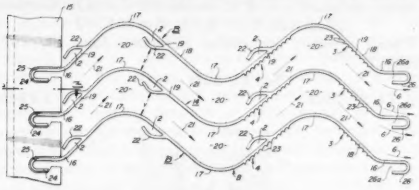
Continuation of Ser. No. 72,405, Sept. 15, 1970, abandoned. This application June 29, 1973, Ser. No. 374,881

Int. Cl. B01d *45/08*

U.S. Cl. 55—440 **20 Claims**

1. In an eliminator for removing moisture from a gas stream, the combination of a pair of sinuous continuour moisture eliminator blades, each blade having bends with alternate convex and concave apexes, and means supporting said blades in spaced complementary parallelism and defining therewith an open sinuous path for said stream from an inlet at one end of the blades to an outlet at the other end of the blades, a first blade on one side of said path having a convex apex opposite a concave apex of a second blade on the other side of said path, a crescent-shaped vane joined to said second blade

downstream of said concave apex and defining with said second blade a liquid trap opening toward said concave apex, the opening of said trap being located between said concave apex and an adjacent convex apex of said second blade and at no



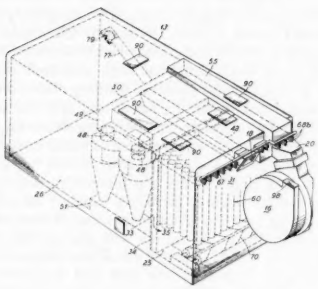
greater distance from said concave apex than midway between said concave and convex apexes, said vane having a crescent-shaped convex surface facing a portion of said convex apex on said first blade and defining therewith a venturi-like restriction in said path.

3,870,489

AIR FILTER SYSTEMS FOR DEBRIS COLLECTING APPARATUS

Roland E. Shaddock, Streator, Ill., assignor to Myers-Sherman Company, Streator, Ill.

Filed Oct. 13, 1972, Ser. No. 297,408
Int. Cl. B01d *50/00*
U.S. Cl. 55—314 **4 Claims**



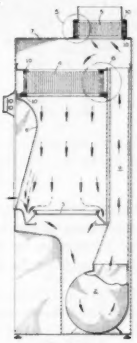
3. A mobile debris collection apparatus comprising:
a vehicle having a frame;
a debris collection box mounted on said frame;
a vertical dividing wall mounted in said box and dividing it into first and second compartments;
a debris-laden air inlet to said first compartment;
a first air filtration mounted in said first compartment and formed with a filter passage such that air can pass up through said first air filtration system from said first compartment;
an air outlet extending to the top of said first air filtration system;
means exterior to said box for inducing air flow from said air outlet;
a first closure means mounted on the top of said first filtration system to disconnect it from said air outlet;
a second separate and distinct air filtration system of a type different from said first air filtration system mounted in said second compartment and its outlet communicating with said air outlet;
a second closure means mounted in said vertical dividing wall such that when said second closure means is open and said first closure means is closed, the debris-laden air passes exclusively through said second air filtration system, and when said second closure means is closed and said first closure means is opened, the debris-laden air passes exclusively through said first air filtration system.

3,870,490

FILTER AND SEAL

Jerome J. Landy, 13700 S.W. 78th Ct., Miami, Fla. 32158

Filed Apr. 29, 1974, Ser. No. 464,816
Int. Cl. B01d *31/00*
U.S. Cl. 55—355 **9 Claims**



1. A filter and seal, said filter having a frame periphery with marginal edges to be secured to a support, said seal comprising, in combination:
a gasket body of resilient material,
a plurality of tongues on one face of said gasket body,
a plurality of grooves defined between said tongues on said gasket body,
means for securing said gasket body in sealed adhesive relationship to the filter frame,
and a sealant of inert stable grease-like material in the grooves defined between said tongues, whereby, upon compressing the gasket members against the sealant in compressive relationship to the support means for holding the filter, a seal is defined between the interface of the tongues of the gasket and the support means which is wetted by the sealant.

3,870,491

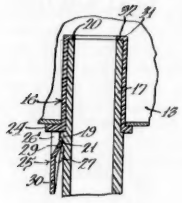
MEANS FOR REMOVABLY CONNECTING A DIRT COLLECTING RECEPTACLE IN A VACUUM CLEANER

Dale M. Friesen, and Erwin E. Nordeen, both of Saint Paul, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,914
Int. Cl. B01d *46/02*
U.S. Cl. 55—376 **13 Claims**

1. In a vacuum cleaner having an air flow means including a duct having an outer end, and a dirt collecting receptacle, means for releasably connecting the dirt collecting receptacle to the outer end of the duct comprising: means defining a first shoulder on said duct spaced from said duct outer end; tubular connector means on said dirt collecting receptacle removably fitted about said duct outer end to provide an air flow connection between said duct and receptacle; means carried by said tubular connector means defining a lever having a first end normally disposed in retained engagement with said first shoulder when said tubular connector means is fitted to said duct outer end, and an opposite, manipulating end; and means defining a fulcrum adjacent the mid-portion of the lever to arrange said lever as a first class lever, depression of said

manipulating end of the lever causing swinging of said first lever end free of engagement with said first shoulder to permit removal of said tubular connector means and dirt collecting receptacle from said air flow duct as for disposal of collected



dirt therefrom, said fulcrum being spaced relative to said first shoulder to cause a component of the force of depression of said lever manipulating portion to be directed to urge said tubular connector means away from the fitted connection with said duct outer end.

3,870,492

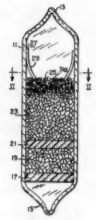
APPARATUS FOR COLLECTING SAMPLES OF CONTAMINANTS

Lloyd V. Guild, 358 Park Rd., Bethel Park, Pa. 15102

Filed Aug. 9, 1973, Ser. No. 387,016

Int. Cl. B01d *53/04*

U.S. Cl. 55—387 **2 Claims**



2. Apparatus for collecting samples of contaminants in the fluid of a region comprising a tube through which said fluid is to flow having therein, at least one layer of particulated contaminant-adsorbing or absorbing material, said layer extending throughout the whole cross-section of said tube, a mass of permeable material in said tube engaging said layer, said mass being permeable but the cross-sectional area of the pores in said mass being predominately smaller than the smallest cross-sectional area of the particles of said adsorbing or absorbing material, and a U-shaped spring having an apex engaging said mass and having legs engaging, and compressed by, the walls of said tube and by the compression exerted by said walls causing said apex to exert a force on said mass to preclude movement of said mass away from said layer and this movement of the particles of said adsorbing or absorbing material away from said layer along said tube, the developed length of the spring being greater than twice the inner diameter of the tube.

3,870,493

APPARATUS FOR SEPARATING LIQUID FROM A LIQUID CONTAINING GAS FLOW

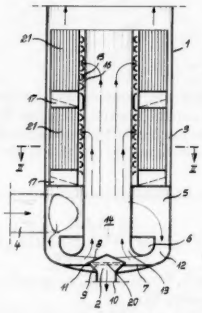
Horst Kall, and Klaus Riedel, both of Gummersbach, Germany, assignors to L. & C. Steinmuller G.m.b.H., Germany

Filed June 9, 1972, Ser. No. 261,372

Claims priority, application Germany, June 11, 1971, 2128897

Int. Cl. B01d *45/12*

U.S. Cl. 55—391 **5 Claims**



1. An apparatus for separating liquid from a liquid containing gas flow, which includes: container means, coarse separator means arranged in the lower portion of said container means, fine separator means arranged in the upper portion of said container means in vertically spaced relationship to said coarse separator means and provided with means for discharging the gas from which liquid has been separated in said fine separator means, annular chamber forming means interposed between said coarse separator means and said fine separator means and having at least one inlet forming means tangentially disposed for connection with a source of liquid containing gas to be processed, said annular chamber means being open at the bottom and closed at the top thereof, means forming a region of communication including conduit means axially arranged within said container means and closed at the top and communicating at the bottom with said annular chamber means, deviating means arranged within the region of communication of said conduit means with said annular chamber means and together with said container means and said coarse separator means forming nozzle means tapering in the direction toward said conduit means and establishing the communication between said annular chamber means and said conduit means, and gas flow guiding and distributing means forming part of at least a portion of that section of the wall of said conduit means which is located above said annular chamber, said guiding and distributing means forming with each other nozzle-shaped passages communicating with said fine separator means.

3,870,494

GREASE FILTER FOR KITCHEN VENTILATORS

DeWitt H. Doane, Rt. No. 2, Long Grove, Ill. 60047

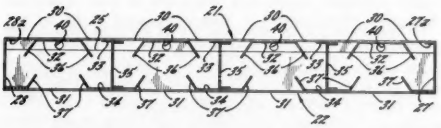
Filed Jan. 24, 1973, Ser. No. 326,266

Int. Cl. B01d *45/06*

U.S. Cl. 55—443 **7 Claims**

1. A grease filter for kitchen ventilating systems and the like, said filter comprising the combination of a housing that is elongated in the X and Y directions and less than 2 inches in the Z direction so that the housing will fit in the space normally provided for mesh-type filters in a kitchen ventilating system, said housing forming closed top and bottom walls lying substantially in X–S planes, closed side walls lying substantially in the Y–Z planes, and front and rear walls lying substantially in X–Y planes, said front wall forming a multi-

plicity of spaced entrance openings which are uniformly elongated in the Y direction and relatively narrow in the X direction, each of said entrance openings formed by a pair of edges of said front wall elongated in the Y direction on opposite sides of the opening said rear wall forming a multiplicity of exit openings each of which is located midway between a pair of adjacent entrance openings, said exit openings also being uniformly elongated in the Y direction and relatively narrow in the X direction, a multiplicity of interior baffles lying substantially in Y–Z planes within said housing, each of said interior baffles comprising a single sheet of metal extending from a line midway between an adjacent pair of said exit openings on said rear wall to a line midway between an adjacent pair of said entrance openings on said front wall so that opposite sides of each of said interior baffles are exposed to said adjacent pair of entrance openings, a multiplicity of entrance baffles equal to the number of entrance openings extending into said housing from the elongated edges of said entrance openings, each of said entrance baffles extending from one of the elongated edges of one of said entrance openings toward the side wall or the interior baffle that is closest



to said entrance opening with the rear edge of each entrance being spaced farther away from said closest sidewall or interior baffle than the other elongated edge of its entrance opening, the entrance baffle originating at the entrance opening edge in said front wall that is farther away from said closest side wall or interior baffle and extending toward said closest side wall or interior baffle at an acute angle relative to said front wall so as to deflect an entering exhaust stream toward said closest side wall or interior baffle as the exhaust stream passes rearwardly through said housing, and a multiplicity of exit baffles equal to the number of entrance baffles extending into said housing from the elongated edges of said exit openings, each of said exit baffles extending from an elongated edge of one of said exit openings toward the opposite elongated edge of the same exit opening at an acute angle relative to said rear wall so as to deflect the exhaust stream moving rearwardly from each entrance opening in the forward direction away from said rear wall before the exhaust stream is discharged through said exit opening, said bottom wall forming a multiplicity of drain openings adjacent said front wall and spaced away from said entrance openings in the X direction.

3,870,495
PARTICULATE AND/OR GAS FILTERS AND ASSOCIATED FILTERING EQUIPMENT TO PURIFY AIR TO BE BREATHED BY PERSONS IN VEHICLES AND/OR BUILDINGS, AND MANUFACTURE AND INSTALLATION OF THESE FILTERS

Bruce E. Dixson, Grand Junction; Marcus I. Hoffman, III, Palisade, and Milton A. Walls, Grand Junction, all of Colo., assignors to Air Purification Systems, Inc., Grand Junction, Colo.

Filed Dec. 22, 1972, Ser. No. 317,829
Int. Cl. B01d *50/00*
U.S. Cl. 55—489 **22 Claims**

1. For installation in fluid filtering equipment, a fluid filter cartridge comprising at least two layers of filter materials each of said layers including random multiple through passageways of non-uniform, varying diameters, in consequential portion of said passageways being oversized with respect to the predetermined porosity of said filter material, said two layers being juxtaposed and retained in a fixed, face-to-face relationship, so that the air to be purified passes directly through both of said layers in substantially undeviating fashion and whereby

there is no substantial alignment of said oversized passageways in the filter materials through which fluid might pass without being sufficiently filtered.

3,870,496
METHOD OF CREATING A FOAMED GLASS PRODUCT FROM WASTE GLASS

Ivan B. Cutler, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 174,220, Aug. 23, 1971, abandoned. This application Sept. 12, 1973, Ser. No. 387,883
Int. Cl. C03b *19/08*
U.S. Cl. 65—22 **3 Claims**

2. A method of creating a foamed glass product comprising the steps of:

obtaining a finely divided waste glass;

reacting the molecular structure of the glass with hydroxide groups thereby lowering the softening temperature of the glass from a first, higher softening temperature to a second, lower softening temperture;

heating the glass to the lower softening temperature but below the melting point of the unmodified glass to thereby soften the modified glass and release the hydroxide groups from the structure of the glass, the hydroxide groups combining to form water vapor;

foaming the softened glass with the water vapor while raising the softening temperature of the glass by releasing the hydroxide groups from the glass molecular structure; and

cooling the foamed glass.

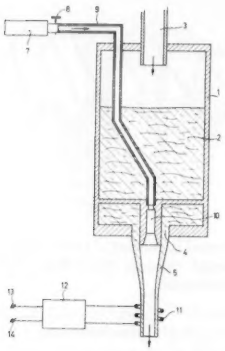
3,870,497
METHOD ELIMINATING DISCONTINUITIES IN A QUARTZ ARTICLE

Raymond Francois Spiessens, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,419
Claims priority, application Netherlands, Nov. 2, 1972, 7214796
Int. Cl. C03c *15/00*; **C03b** *15/14, 21/00*
U.S. Cl. 65—32 **7 Claims**

1. A method of eliminating discontinuities and removing impurities by means of a thermal treatment, in an elongated quartz tube comprising: first providing a plasma burner thermal source which includes a coil and which generates a high frequency field; second, moving the tube with respect to said thermal source in a direction which is substantially parallel to the axis of the tube, third, passing an inert gas to the burner

thermal source and to the tube in such a manner that said inert gas is at least present at the area of said burner thermal source



near the tube to bring the tube locally to a temperature above its softening point.

3,870,498

METHOD OF MANUFACTURING HOLLOW GLASS ARTICLES

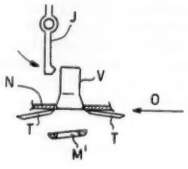
Herman Buurman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,641

Claims priority, application Netherlands, Apr. 16, 1973, 7305264

Int. Cl. C03b *21/00*

U.S. Cl. 65—106 **2 Claims**



1. A method of manufacturing hollow glass articles, comprising the steps of:

depositing molten glass on a carrier having an opening therethrough, said glass covering the opening;

moving the carrier along a closed path while performing the successive steps in the following sequence of:

permitting a first portion of said glass to sag through said opening;

forming said molten glass into a hollow article having one open end directed upward at the level of said opening;

rotating said carrier about a horizontal axis to invert said article so that said open end is opened downward;

severing a second portion of said article protruding downward from said opening; and

removing said article from said carrier while said end is opened downward.

3,870,499

APPARATUS FOR MANUFACTURING SOLID DOUBLE LAYER SHEET GLASS

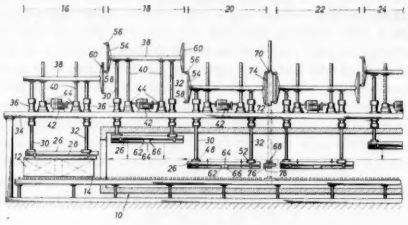
Otto Stehl, Brucker Holt 46, Essen-Bredeney, Germany

Filed Feb. 20, 1974, Ser. No. 444,185

Claims priority, application Germany, Mar. 24, 1973, 2314715

Int. Cl. C03b *23/24*

U.S. Cl. 65—156 **5 Claims**



1. Apparatus for the manufacture of all-glass double windowpanes by welding the longitudinal and transverse edges of single panes carried upright through a tunnel oven, having a lower guide track for the support and guidance of the lower pane edges, a vertically adjustable upper guide track for the guidance of the upper pane edges, and fusing means that is adjustable in height according to the pane height for fusing the upper, horizontal pane edges, the upper guide track being divided into sections which are each automatically and vertically adjustable independently of one another by means of a driving device associated with each guide track section according to the height of the particular pane therein contained, the length of said sections in the conveying direction being substantially the same as the length of the individual panes to be fused together, each guide track section further having means for sensing the relative heights of any two adjacent guide track sections and for equalizing the vertical position of the guide track section next following in the direction of conveyance to that of the preceding one.

3,870,500

APPARATUS FOR BENDING GLASS SHEETS

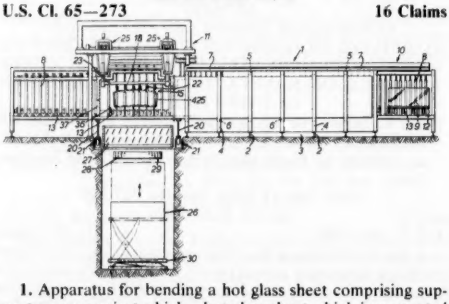
Harry Ross Scarlett Jack, Springfield; Peter Henry Richards, Kenilworth, and Kenneth George Skelding, Hollywood, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Mar. 12, 1974, Ser. No. 450,341

Claims priority, application Great Britain, July 20, 1973, 34704/73

Int. Cl. C03b *23/02*

U.S. Cl. 65—273 **16 Claims**



1. Apparatus for bending a hot glass sheet comprising support means against which a hot glass sheet which is supported on its lower edge leans at a near-vertical angle, co-operating male and female dies associated with said support means one of which dies is constructed to pass from behind and through

said support means as the dies close on to the glass sheet, forwardly projecting lifting fingers mounted at the bottom of said one die, which fingers are normally downwardly depressed to pass beneath the supported lower edge of a hot glass sheet as said one die passes through said support means, and an actuating mechanism for the lifting fingers operable to raise the lifting fingers sufficiently to lift the glass sheet and provide support for the sheet as it is carried by said one die towards the other die.

3,870,501

BENZOXAZOLES AS DESUCKERING AGENTS

Yoshihiko Hirono, Hiratsuka; Hatsuo Ogino; Seiichi Nishikawa, both of Oiso-machi; Koshin Miyazaki; Masatoshi Yakushiji, both of Odawara, and Tomio Yagihara, Oiso-machi, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

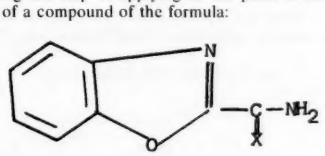
Filed Oct. 9, 1973, Ser. No. 404,265

Claims priority, application Japan, Oct. 11, 1972, 47-101147

Int. Cl. A01n *9/22*

U.S. Cl. 71—78 **1 Claim**

1. A method for controlling the growth of tobacco suckers comprising the step of applying to the plant a desuckering amount of a compound of the formula:



wherein

X is oxygen or sulfur, thereby inhibiting the growth of axillary buds.

3,870,502

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhein, Germany

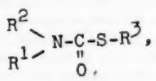
Filed Apr. 4, 1973, Ser. No. 348,084

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 **5 Claims**

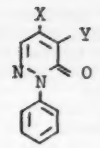
1. A selective herbicide composition containing a herbicidally effective amount of

a. a thiol carbamate of the formula

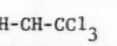


wherein R^1 denotes lower alkyl or alkynyl of a maximum of 4 carbon atoms, R^2 denotes cyclohexyl or a bicycloaliphatic or tricycloaliphatic hydrocarbon radical of a maximum of 8 carbon atoms and R^3 denotes lower alkyl of a maximum of 4 carbon atoms and

b. a compound of the formula



where Y denotes chlorine or bromine and X denotes



or NH—CO—COO—R, R denoting tert-butyl or isopropyl, in a weight ratio of a to b in the range of 1:5 to 5:1.

3,870,503

RIPENING OF SUGARCANE BY USE OF N-VALERIC ACID

Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters Association, Honolulu, Hawaii

Filed Oct. 3, 1973, Ser. No. 403,019

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **10 Claims**

1. A process for increasing the sugar yield of grown sugarcane which comprises applying an effective amount of a sugarcane ripening agent taken from the group consisting of n-valeric acid and sodium salts or ethyl esters of alkanoic monoacids having 1 to 5 carbon atoms to the cane at a time at least about 2 and up to about 10 weeks prior to harvest.

3,870,504

CYCLOALKYLPHENYL UREAS AS HERBICIDES

Jan Johannes Van Daalen, and Jasper Daams, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

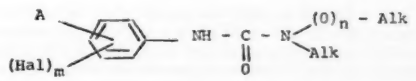
Division of Ser. No. 262,331, June 13, 1972, Pat. No. 3,799,964, which is a continuation-in-part of Ser. No. 61,402, Aug. 5, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 428,392

Claims priority, application Netherlands, Aug. 13, 1969, 6912348

Int. Cl. A01n *9/20*

U.S. Cl. 71—120 **8 Claims**

1. A preparation for controlling undesirable plant growth, wherein the preparation contains an effective amount of a compound of the formula



where

A is a cycloalkyl group containing 3 or 4 carbon atoms,

Hal is a halogen atom,

Alk is an alkyl group containing from 1 to 4 carbon atoms,

$n = 0$ or 1 and

$m = 0$ or 1,

as an active ingredient in combination with a solid or liquid inert carrier material.

3,870,505
WEED CONTROL WITH SUBSTITUTED PHENYLHYDRAZONES

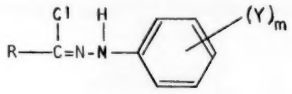
Girts Kaugars, Cooper, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 874,976, Nov. 7, 1969, Pat. No. 3,745,215. This application Jan. 26, 1973, Ser. No. 326,804

Int. Cl. A01n *9/20*

U.S. Cl. 71—121 **7 Claims**

1. The process of controlling weeds which comprises applying to weeds or a weed situs a herbicidally effective amount of a compound of the formula:



wherein R is alkyl of from 1 to 5 carbon atoms, inclusive; Y is alkyl of from 1 to 6 carbon atoms, inclusive, halogen, trifluoromethyl, and nitro; *m* is an integer from 0 to 3, inclusive; there may be no more than one nitro group, and the Y's may be selected independently when m is 2 or 3.

3,870,506
BENEFICIATION OF ORES

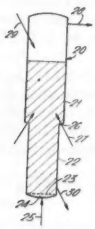
Michael Robinson, Grimsby; Harry Brian Wilson, North Thoresby, and David Antony Gray, Grimsby, all of England, assignors to Laporte Industries Limited, London, England

Filed Jan. 24, 1972, Ser. No. 220,243

Claims priority, application Great Britain, Jan. 27, 1971, 03241/71

Int. Cl. C22b *1/00*

U.S. Cl. 75—1 **10 Claims**



1. In a method for the beneficiation of an ore containing titanium dioxide and a mixture of iron oxides to produce a beneficiate containing a reduced proportion of iron oxides, wherein the improvement comprises forming a mixture of the ore containing the said mixture of iron oxides and carbon, the carbon content of the mixture being in the range of from 20 to 40% by weight and said carbon content being in excess of that necessary for reaction, enclosing the mixture in a fluidized bed reactor, treating the mixture in a fluidized bed reactor at a temperature in the range of 800° to 1,000°C. with a treatment gas essentially consisting of 20 to 50% by volume of chlorine, 0 to 10% by volume of oxygen and a diluent gas whereby control of the beneficiation reaction is effected by the proportion of chlorine in the reactant gas, and recovering the resulting beneficiate from the reactor.

3,870,507
CONTROL OF POLLUTION BY RECYCLING SOLID PARTICULATE STEEL MILL WASTES

John E. Allen, Lake Forest, Ill., assignor to Ferro-Carb Agglomeration Ltd., Inc., Chicago, Ill.

Filed May 14, 1973, Ser. No. 359,776

Int. Cl. C21b *1/28*

U.S. Cl. 75—4 **3 Claims**

1. In the operation of a steel mill, the method of disposing of iron- and carbon-containing particulate waste of principally dust size which comprises (1) mixing the particulate waste containing at least 5% of Fe with 2 to 15%, based on total weight of waste and binder, of a bituminous binder having a ball and ring softening point below 212°F and being free of combustibles volatile at 500°F, to produce a briquettable mix consisting essentially of the said particulate waste and the said binder; (2) briquetting the mix; (3) heating the briquettes in gas containing at least 10% of oxygen at a gas temperature of 350° to 600°F for 30 to 90 minutes to selectively remove hydrogen from the binder and induce a cementing reaction between the binder and the iron-containing waste to produce briquettes strong enough to be charged into plant processes; and (4) recycling said heat-treated briquettes into the plant processes to recover their iron and carbon values.

3,870,508
ELECTROSLAG REFINING

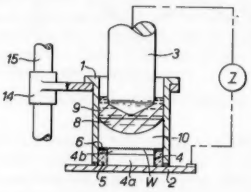
John Barry Cartwright, Sheffield, England, assignor to The British Iron and Steel Research Association, London, England

Filed Jan. 12, 1973, Ser. No. 323,320

Claims priority, application Great Britain, Jan. 27, 1972, 3886/72

Int. Cl. C22d *7/00*; **B22d** *27/02*

U.S. Cl. 75—10 **8 Claims**



1. A method of forming an ingot of refined metal by the electroslag refining process comprising the steps of introducing into the lower open end of a cooled mould a solid uncooled electrically-conductive member of a material weldably compatible with the metal to be refined, the member having a surface area sufficient to conduct the full working current employed in the process but small enough to leave an annular space beneath the top of said member between its periphery and the internal walls of the mould, filling said annular space with a compactible electrically insulating material which accommodates reductions in the annular spacing caused by differential thermal expansion between the member and the lower end of the mould into which the member extends and which is readily removed from the surfaces of the member and the ingot formed following completion of the process, forming a bath of molten slag within the mould and above the member and the electrically insulating material, passing an electric current through the slag bath to maintain the temperature of the bath at or above the melting point of the metal to be refined and causing droplets of unrefined metal to travel through the molten slag bath and to collect above the member and compactible electrically insulating material, which droplets form a pool of refined liquid metal which progressively solidifies to form an ingot of refined metal which is supported by the aforesaid member and electrically insulating material and is welded to the upper surface of the member.

3,870,509
METHOD OF DISPOSING OF PARTICULATE SCRAP IRON

John E. Allen, Lake Forest, Ill., assignor to Ferro-Carb Agglomeration Ltd., Inc., Chicago, Ill.

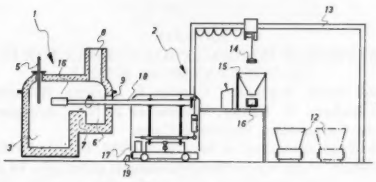
Continuation-in-part of Ser. No. 359,776, May 14, 1973,. This application Nov. 19, 1973, Ser. No. 416,966
Int. Cl. C21b *1/30; 75 4;3;43;44 R;44 S*
U.S. Cl. 75—44 S **3 Claims**

1. The method of disposing of particulate iron and steel scrap consisting essentially of metallic iron in pieces no larger than ¼ inch which comprises (1) mixing the particulate scrap with a bituminous binder having a ball and ring softening point below 212°F, and free of combustibles volatile at 500°F to produce a mix containing between 2 and 10% of binder with the balance of the mix being essentially the particulate scrap; (2) briquetting the mix; (3) heating the briquettes in gas containing at least 10% of oxygen at a gas temperature of 350° to 600°F for 30 to 90 minutes to selectively remove hydrogen from the binder and induce a cementing action between the binder and the iron; and (4) recycling the briquettes into a metal-making process.

3,870,510
METHOD FOR THE INTRODUCTION OF SOLID PRODUCTS

Daniël Martin, and Pierre Vayssiere, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St.-Germain-en-Laye, France

Filed Mar. 26, 1973, Ser. No. 344,718
Claims priority, application France, Mar. 29, 1972, 72.11119
Int. Cl. C21c *5/56*
U.S. Cl. 75—61 **5 Claims**



1. A method of introducing solid products into a plant for the continuous refining of pig iron steel, said plant being of the type comprising a reaction container and a settling tank separated from the reaction container by a sill; said method comprising introducing said solid products through an aperture formed in the wall of the settling tank, then conveying said solid products across said settling tank and said sill into said reaction container, and then discharging said products in said reaction container.

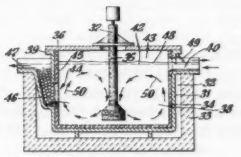
3,870,511
PROCESS FOR REFINING MOLTEN ALUMINUM

Andrew Geza Szekely, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 211,950, Dec. 27, 1971, Pat. No. 3,743,263. This application Jan. 15, 1973, Ser. No. 323,785
Int. Cl. C22b *21/06, 9/12*
U.S. Cl. 75—68 R **19 Claims**

1. A process for refining molten aluminum comprising the steps of:

1. feeding molten aluminum into a refining zone,
2. maintaining a protective atmosphere above the surface of said molten aluminum at a greater than atmospheric pressure, thereby preventing contact of the melt with air or atmospheric moisture,
3. providing a gas injection device submerged in said molten aluminum comprising (a) a shaft fixedly attached to a vaned rotor at its lower end, (b) a stationary sleeve surrounding said shaft, and (c) a passageway for conveying and discharging inert gas into the molten metal running the length of said gas injection device,
4. introducing an inert gas into the upper end of said passageway under sufficient pressure to be injected into the melt,
5. preheating the inert gas by contact thereof with the hot walls of the passageway, whereby the gas is expanded, before being sub-divided into gas bubbles, to the point where thermal growth of said bubbles in the melt is substantially prevented,
6. directing the preheated gas to the vanes of said rotor of said gas injection device,

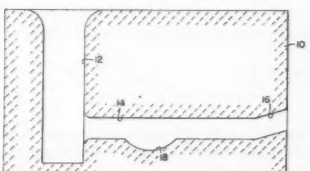


7. sub-dividing the inert gas into discrete gas bubbles by rotating said vaned rotor at a speed sufficient to create a circulation pattern in the molten aluminum such that the gas bubbles are transported substantially radially outward with a downward component relative to their points of entry into the melt thereby coming into intimate contact with substantially the entire mass of molten aluminum in said refining zone, resulting in the removal of dissolved hydrogen and substantially all non-metallic impurities from said melt,
8. withdrawing the spent inert gas containing hydrogen while collecting other non-metallic impurities in a dross layer on the surface of the molten aluminum, and
9. withdrawing the refined molten aluminum from said refining zone.

3,870,512
METHOD OF PRODUCING SPHEROIDAL GRAPHITE CAST IRON

Robert Stormo Lee, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Mar. 5, 1973, Ser. No. 338,140
Int. Cl. C22c *37/04*
U.S. Cl. 75—130 R **8 Claims**



1. A method of treating molten cast iron for the production of spheroidal graphite cast iron comprising passing molten cast iron of such composition as to freeze with free graphite in flake form through a channel having a width greater than its height and which includes a shallow depression in the lower surface thereof, a nodularizing agent being present in the depression in an amount sufficient to convert the graphite to spheroidal form, said molten cast iron passing through the

channel with a substantially laminar flow and contacting said nodularizing agent as it passes through the channel and when passing through the channel traveling at a rate sufficient to scrub away any vapor which forms at the interface between the molten cast iron and the nodularizing agent.

3,870,513

WHITE METAL CASTING ALLOY AND METHOD OF MAKING SAME

Robert S. Darnell, Washington, R.I., and Everett G. Morrissey, Bristol, Mass., assignors to A. J. Oster, Co., Providence, R.I.

Filed Dec. 3, 1973, Ser. No. 420,948
Int. Cl. C22c *13/00*
U.S. Cl. 75—175 A **3 Claims**

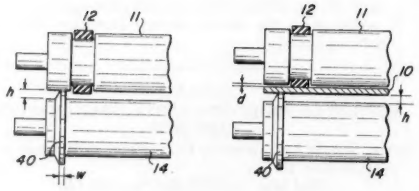
1. A white metal alloy consisting of 91.5 – 92.5% tin, 2.9 – 3.1% antimony, 1.4 – 1.6% cadmium, and 3.3 – 3.7% lead.

3,870,514

LIQUID DEVELOPMENT FOR THE ELECTRONIC PHOTOGRAPHY

Masamichi Sato, and Shigeru Tezuka, both of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed June 18, 1973, Ser. No. 370,908
Int. Cl. G03g *13/10*
U.S. Cl. 96—1 LY **2 Claims**



1. The method of producing a visual reproduction of an object on the surface of an imaging member which comprises insulating support rollers for said imaging member from development electrode rollers in an electrophotographic device by passing successive portions of said imaging member between said support rollers and said development electrode rollers wherein said support rollers have upraised flanges at both ends thereof of a height between about 0.3 to 0.5 mm and a width between about 0.1 to about 1 mm, applying a developing voltage only when said imaging member has been inserted between said support rollers and said development electrode rollers so that no voltage is applied in the absence of said imaging member, and supplying liquid developer to said imaging member.

3,870,515

METHOD FOR ELECTROSTATIC PAPER STRIPPING BY NEUTRALIZATION OF TRANSFER CHARGE

Norbett H. Kaupp, Newark, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 41,668, May 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 585,816, Oct. 11, 1966, abandoned. This application Jan. 15, 1974, Ser. No. 433,971
Int. Cl. G03q *13/16. 13/22*
U.S. Cl. 96—1.4 **9 Claims**

8. In the method of producing a xerographic copy which includes the steps of charging a photoconductive surface with an electrostatic charge, exposing the charged surface to dissipate the charge in an image configuration corresponding to the object to be reproduced, developing the exposed surface with charged toner particles and electrostatically transferring the toner particles to an insulating backing sheet, including electrostatically bonding the backing sheet to the photoconductive surface by applying charges of a first polarity onto the backing sheet, the improvement comprising:

subsequently decreasing the electrostatic bonding between the backing sheet and the photoconductive surface to electrostatically strip the toner-bearing backing sheet from the photoconductive surface,

wherein the electrostatic bonding decreasing step is carried out by applying to the backing sheet corona emissions having a net second polarity opposite from the first polarity charges on the backing sheet and large enough to minimize said electrostatic bonding but lower than the potential which would repel the toner particles back onto the photoconductive surface; and

the backing sheet is then allowed to separate from the photoconductive surface where said surface is cylindrical by the self-straightening resiliency of the backing sheet.

3,870,516

METHOD OF IMAGING PHOTOCONDUCTOR IN CHANGE TRANSPORT BINDER

Michael Smith, Rochester; Charles F. Hackett, Williamson, and Richard W. Radler, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 93,994, Dec. 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 14,281, Feb. 26, 1970, abandoned. This application June 20, 1973, Ser. No. 371,646
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.5 **13 Claims**

1. A method of imaging which comprises:

a. providing an imaging member having a binder layer contained on a supporting substrate, said binder layer having a thickness from about 2 to 100 microns comprising photoconductive particles dispersed in an unoriented fashion in an electrically active organic matrix material, said photoconductive particles having the facility for photo-excited hole generation and injection, said active matrix material exhibiting a facility for supporting hole injection from said photoconductive particles and capable of facile hole transport, said photoconductive particles being present in an amount from about 0.1 to 5 percent by volume of said binder layer, and wherein said active matrix comprises at least one material selected from the group consisting of poly-1-vinylpyrene, polymethylene pyrene, N-substituted polymeric acrylic acid amides of pyrene, pyrene, tetraphene, 1-acetylpyrene, 2,3-benzochrysene, 6,7-benzopyrene, 1-bromopyrene, 1-ethylpyrene, 1-methylpyrene, perylene, 2-phenylindole, tetracene, picene, 1,3,6,8-tetraphenylpyrene, chrysene, fluorene, fluorenone, phenanthrene, triphenylene, 1,2,5,6-dibenzanthracene, 1,2,3,4-dibenzanthracene, 2,3-benzopyrene, 2,3-benzochrysene, anthraquinone, dibenzothiophene and naphthalene;

b. uniformly electrostatically charging said binder layer, followed by:

c. exposing said charged layer to a source of activating radiation to which the photoconductor particles are absorbing and to which the active organic matrix material is non-absorbing, the exposure being in the form of a pattern of light and shadow optically projected toward the layer, whereby the photo-excited holes generated by said photoconductive particles are injected into and are transported through said active matrix material to form a latent electrostatic image on the surface of said binder layer.

3,870,517
COLOR IMAGE REPRODUCTION SHEET EMPLOYED IN PHOTOELECTROPHORETIC IMAGING

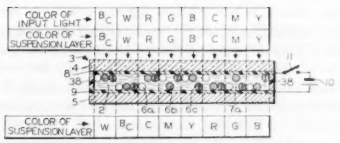
Isao Ota, and Tetsuro Otsuka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Division of Ser. No. 81,290, Oct. 16, 1970, Pat. No. 3,689,400. This application June 5, 1972, Ser. No. 259,817

Claims priority, application Japan, Oct. 18, 1969, 44-83561

Int. Cl. G03g *5/00*

U.S. Cl. 96—1.5 **10 Claims**



1. A color image reproduction sheet for reproducing a directly visible color image thereon, the sheet consisting essentially of an electrophoretic suspension layer having a whitte colored opaque electrically insulating suspending medium and at least three differently colored photosensitive electrophoretic materials in the form of finely divided powder suspended in said white colored opaque suspending medium, said white colored opaque electrically insulating suspending medium being non-fracturable during the image reproduction and said at least three differently colored photosensitive electrophoretic materials consisting essentially of cyan colored material which is principally photosensitive to red light, magenta colored material which is principally photosensitive to green light, and yellow colored material which is principally photosensitive to blue light, and a base on which said suspension layer is supported, whereby when said sheet is passed between a substantially transparent first electrode and a second electrode which are spaced from and opposed to each other with the electrodes against the two opposite major surfaces of said suspension layer, respectively, with the transparent electrode against the free surface of the suspension layer, and a D. C. electric field is applied across the suspension layer between said electrodes, and said suspension layer is exposed to a color image through said transparent electrode, the D.C. electric field changes electrophoretically, in cooperation with the color image, the spatial distribution of said at least three differently colored photosensitive electrophoretic materials so that the optical reflective property of the suspension layer changes in accordance with said color image, a directly visible color image being thus reproduced on said sheet without fracturing said electrophoretic suspension layer.

3,870,518
METHOD OF TRANSFERRING PHOTOGRAPHIC FILM BETWEEN CASSETTE AND AN EXPOSURE DRUM

Werner Fels, Kiel, Germany, assignor to Dr. Ing Rudolf Hell GmbH

Filed Feb. 26, 1973, Ser. No. 335,956

Claims priority, application Germany, Feb. 29, 1972, 2209515

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 R **5 Claims**

1. A method of handling film before and after exposure, comprising:

mounting unexposed film on a shiftable film supporting frame within a cassette having an access opening normally closed by a shiftable closure;

mounting the cassette on a housing of an exposure reproduction apparatus with the access opening of the cassette in registration with an access opening into the housing;

shifting said closure to open the cassette access opening to provide for communication between the openings;

shifting said frame carrying the film through the aligned openings into the housing;

within the housing transferring the film from the frame to a rotary drum;

shifting the frame back into the cassette;

rotating the drum to fully withdraw the film from the cassette;

exposing the film while the drum continues in rotation;

reversing the direction of rotation of the drum;

stripping the film from the drum and guiding the film during such reversal of rotation of the drum to return the film into the cassette;

shifting said closure to close the access opening in the cassette;

and removing the cassette from the housing.

3,870,519
S-TRIAZINE DERIVATIVES AS ULTRAVIOLET PROTECTING AGENTS

Bernhard Piller, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 262,855, June 14, 1972, Pat. No. 3,845,049. This application Jan. 14, 1974, Ser. No. 433,429

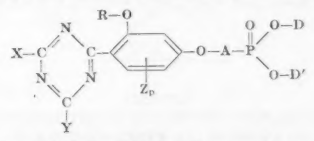
Claims priority, application Switzerland, June 23, 1971, 9167/71

Int. Cl. G03c *1/84*

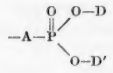
U.S. Cl. 96—51 **15 Claims**

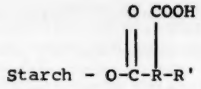
1. Process for protecting organic material against ultravoilet radiation, which comprises incorporating into the material or applying to it an s-triazine derivative of the formula

(I)



wherein X and Y independently of one another each represents an unsubstituted or substituted alkyl radical, an alkenyl, cycloalkyl or aralkyl radical or an unsubstituted or substituted monocyclic or bicyclic, aromatic or heterocyclic radical, which is bonded directly or via a divalent heteroatom grouping to the s-triazine ring, A represents a hydrocarbon radical, D and D'either both represent a hydrogen atom, a cycloalkyl radical, an alkenyl radical or an unsubstituted or substituted alkyl or phenyl radical, or one represents hydrogen and the other represents a cycloalkyl radical, an alkenyl radical or an unsubstituted or substituted alkyl or phenyl radical, R represents a hydrogen atom or the group





wherein A, D and D' have the above-mentioned meanings, Z represents a halogen atom, an RO group, wherein R is defined as above, an alkyl or alkoxy radical, a phenylalkyl radical or the phenyl radical and *p* is 0, 1 or 2.

3,870,520

PHOTOGRAPHIC PROCESSING COMPOSITION

Isao Shimamura; Tadao Shishido; Reiichi Ohi, and Haruhiko Iwano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

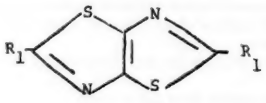
Filed Oct. 3, 1973, Ser. No. 403,293

Claims priority, application Japan, Oct. 5, 1972, 47-100081

Int. Cl. G03c *5/32, 7/16*

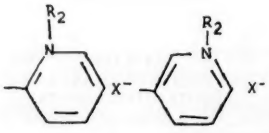
U.S. Cl. 96—60 R **27 Claims**

1. A photographic silver bleaching composition selected from the group consisting of a bleaching solution and a bleaching and fixing solution which comprises (1) a ferric ion complex or a persulfate and (2) a compound represented by the following general formula (I)

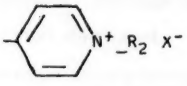


(I)

in which R_1 is



or



R_2 is an alkyl group or a $-CH_2-{}_nSO_3^-$ group; *n* is 3 or 4; and X^- is an anion, and being absent when R_2 is a $-CH_2-SO_3^-$ group.

3,870,521

PHOTOGRAPHIC OVERCOAT COMPOSITION OF AN ALKENYL HALF ESTER OF STARCH

E. Scudder Mackey; Karl Pechmann, and Donald E. Tritten, all of Binghamton, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,485

Int. Cl. G03c *1/76*

U.S. Cl. 96—67 **5 Claims**

1. In a photographic element comprising a support, at least one silver halide layer, and at least one overcoat layer, the improvement comprising said overcoat layer containing a composition comprising an aqueous dispersion, the solids content of which comprises (A) a soluble alkenyl half ester of starch of the formula:

wherein R is a radical selected from the group consisting of dimethylene and trimethylene and wherein R' is a C_{2-8} alkenyl radical, and (B) gelatin, in weight proportions of about 1.1 to 2.0 parts of (A) per 1 part of (B), said overcoat layer being capable of protecting the exterior surface of at least one silver halide layer which is furthermost from said support.

3,870,522

FOGGED, DIRECT-POSITIVE EMULSION CONTAINING HETERODISPERSE AND IRREGULAR COMPOSITE SILVER HALIDE GRAINS

Erik Moisar, and Sieghart Klotzer, both of Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 16, 1973, Ser. No. 360,845

Claims priority, application Germany, May 20, 1972, 2224837

Int. Cl. G03c *1/28*

U.S. Cl. 96—107 **5 Claims**

1. A photographic material comprising a support and a light-sensitive layer containing at least one fogged light-sensitive direct positive silver halide emulsion layer being spontaneously developable with silver halide grains containing internal electron traps wherein the improvement comprises silver halide grains of the fogged emulsion are heterodispersed and irregular having cores which contains interval electron traps and outer shells of silver halide on the cores and having a grain size distribution wherein at least 10 percent of the grains have a size which deviates by at least 40 percent from the average grain diameter, said outer shells of silver halide have been fogged.

3,870,523

HEAT DEVELOPABLE PHOTOGRAPHIC MATERIAL CONTAINING AZO DYES AS SENSITIZERS

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 17, 1974, Ser. No. 434,453

Claims priority, application Japan, Jan. 17, 1973, 48-7624

Int. Cl. G03c *1/02*

U.S. Cl. 96—114.1 **12 Claims**

1. A heat developable photographic material having at least one photosensitive layer on a support, said layer containing the following components:

a. an organic silver salt,

b. a catalytic amount of a photosensitive silver halide or a compound capable of reacting with said organic silver salt (a) to produce a photosensitive silver halide,

c. a reducing agent,

d. a binder, and

e. as a sensitizer, at least one of the following Compounds (I) and (II):

$$Ar_1 - N = N - Ar_2 \quad (I)$$

$$AR_3 - N = N - Ar_4 - N = N - Ar_5 \quad (II)$$

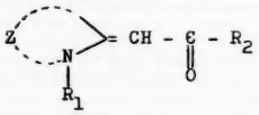
wherein Ar_1, Ar_2, Ar_3 and Ar_5 each represents an aryl group and Ar_4 represents an arylene group, with the proviso that at least one of Ar_1 and Ar_2, and at least one of Ar_3, Ar_4 and Ar_5 is substituted with a $-SO_3M$ group or a $-COOM$ group, M being a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, or a $-NH_4$ group.

3,870,524
PHOTOPOLYMERIZABLE COMPOSITION

Masaru Watanabe; Kesanao Kobayashi; Hiroshi Misu; Akira Sato, all of Kanagawa, and Eiichi Hasegawa, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 7, 1974, Ser. No. 440,426
Claims priority, application Japan, Feb. 7, 1973, 48-14803
Int. Cl. G03c *1/68, 1/04*
U.S. Cl. 96—115 P **11 Claims**

1. A photopolymerizable composition comprising (A) a monomer containing at least two terminal unsaturated groups and photopolymerizable upon irradiation of actinic rays and (B) as a photopolymerization accelerator for said photopolymerizable monomer, a compound represented by the formula:



where Z represents a non-metallic atomic group necessary forming a nitrogen-containing heterocyclic nucleus; R_1 represents an alkyl group; and R_2 represents an alkyl group or an aryl group.

3,870,525
PROCESS FOR PRODUCING PHOTOGRAPHIC FILM HAVING A MAGNETIZABLE LAYER THEREON AND SUCH A PHOTOGRAPHIC FILM

Nobuo Yamamoto; Hideo Kawaguchi, and Katsuharu Furukawa, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

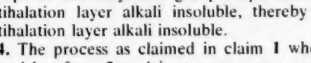
Filed Apr. 24, 1973, Ser. No. 354,055
Claims priority, application Japan, Apr. 12, 1972, 47-41123
Int. Cl. G03c *5/14, 1/84;* **C22c** *39/00*
U.S. Cl. 96—39 **21 Claims**

1. A process for producing a photographic film having thereon a magnetic recording layer by applying a dispersion of a magnetic substance to an antihalation layer of a light-sensitive film for cinema, wherein the dispersion contains a compound or compounds, having at least two isocyanato groups or thioisocyanato groups capable of rendering said antihalation layer alkali insoluble, thereby rendering said antihalation layer alkali insoluble.

4. The process as claimed in claim **1** wherein said compound has from 2 to 4 isocyanato groups or thioisocyanato groups.

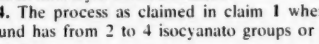
5. The process as claimed in claim **4** wherein said compound is selected from the group consisting of Compounds (I) to (XI) below:

Compound (I)



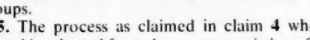
n=2 - 12,

Compound (II)



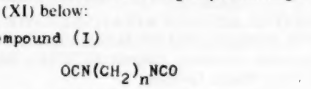
X=O or S,
m, n=2 - 4;

Compound (III)

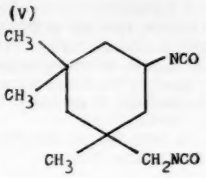


n=2 - 10,

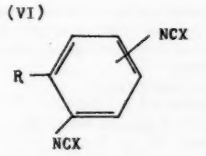
Compound (IV)



Compound (V)

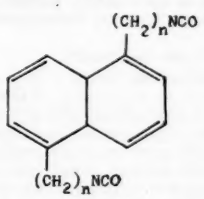


Compound (VI)



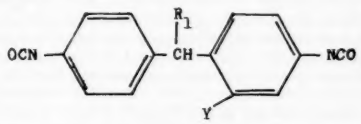
wherein the floating NCX group is located at the o-, m-, or p-position to R, X represents O or S, and R represents a hydrogen atom or a methyl group,

Compound (VII)



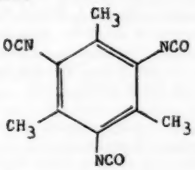
, where n is 0 or 1,

Compound (VIII)

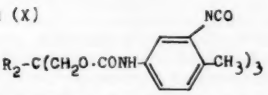


wherein Y represents a hydrogen atom or NCO, and R_1 represents a hydrogen atom or

Compound (IX)

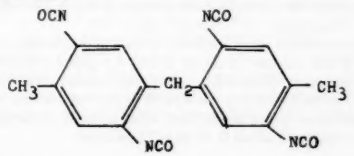


Compound (X)



wherein R_2 represents a C_1 — C_6 alkyl group, and

Compound (XI)



3,870,526
ELECTROLESS DEPOSITION OF COPPER AND COPPER-TIN ALLOYS

Fred Pearlstein, and Robert F. Weightman, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 20, 1973, Ser. No. 399,771
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 **11 Claims**

1. An electroless plating bath for providing a predominately copper deposit which is firmly adherent to various substrates, said bath being devoid of formaldehyde or potassium heptagluconate and comprising

0.5 to 3.0 g/l copper sulfate.$5H_2O$,
1.0 to 10.0 g/l disodium salt of EDTA,
5 to 150 ml/l NH_4OH(28 percent NH_3), and
0.5 to 10.0 g/l DMAB.

3,870,527
GRANULAR STARCH-BASED GUMS

Allen C. Kryger; Charles S. Nevin, and Donald L. Wilhelm, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed June 26, 1972, Ser. No. 266,021
Int. Cl. C09k *3/00*; **C08b** *19/06*
U.S. Cl. 106—2 **5 Claims**

1. In an aqueous solution for coating lithographic plates, a hydrophilic film forming hydrocolloid comprising a starch derivative containing 30 percent or less by weight amylose, said starch comprising an acid hydrolyzed, initially granular starch derivative which has a Brookfield viscosity in the range of about 50 to about 500 centipoises when measured in a 25 percent by weight aqueous solution at 80°F. using a No. 1 spindle at 20 r.p.m.; said solution remaining viscosity stable for at least one month; said granular starch having a degree of substitution of about 0.1 to about 0.3 of at least one substituent having 1–4 carbon atoms and selected from the group consisting of alkyl, hydroxyalkyl, cyanoalkyl, amidoalkyl, and acyl groups, and said granular starch derivative having been washed with water to remove substantially all lower molecular weight, water soluble impurities including starch cleavage products and inorganic salts.

3,870,528
INFRARED AND VISIBLE DUAL DYE JET PRINTER INK

Kenneth E. Edds, Versailles; Donald L. Elbert, Lexington, and Jerry F. Stone, Georgetown, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,346
Int. Cl. C09d *11/02, 11/12*
U.S. Cl. 106—22 **4 Claims**

1. An optical character reader readable and visually readable ink jet ink formulation comprising:

an infrared absorbing dye which exhibits high absorptivity for radiation with a wavelength of about 9000 A, present in the ink formulation in about 1 to 5 percent;

a dye which highly absorbs in the visible spectrum and which permanently dyes the fibers of a cellulosic substrate present in about 2 to 5 percent concentration and where said dye is selected from group consisting of dyes having color index numbers of 30235 and 30245;

a polyethylene glycol of an average molecular weight of from about 500 to 600, present in the ink in about 1 to 3.5 percent:

a dye solvent for at least one of said dyes, present in the ink in the amount of about 2.0 to 4.5 percent wherein said solvent is selected from the group consisting of N-methyl-2-pyrrolidone and diethylene glycol monoethyl ether;

diethylene glycol monobutyl ether present in the ink in the amount of about 0.25 to 0.75 percent;

and the balance water, all percentages being percentages by weight with respect to the weight of the entire ink formulation.

3,870,529
METHOD OF PRODUCING CASTING MOULDS FOR PRECISION CASTING

Takeomi Okumoto, Kamakura; Hiroshi Ueda, Kashiwa; Junji Sakai, Tokyo, and Yogo Shimada, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1973, Ser. No. 342,410
Claims priority, application Japan, Mar. 21, 1972, 47-27394
Int. Cl. B28b *7/34*
U.S. Cl. 106—38.3 **33 Claims**

1. A method for producing a casting mould for use in precision casting comprising preparing a flowable refractory slurry comprising a mixture of a powdered refractory material, a binder obtained by the hydrolysis of ethyl silicate with an amount of water smaller than the theoretical hydrolysis amount of water, and a sufficient amount of a gelling promoting agent so that gelling will commence is about 6 to 8 minutes after said slurry is poured into a shaping mould; pouring said flowable refractory slurry into a shaping mould; removing the resultant casting mould from said shaping mould after said slurry has gelled; immersing said casting mould in a hardening water containing sufficient surface active agent therein to decrease the surface tension of said hardening water to thereby completely harden said casting mould; and then drying and calcining said casting mould to obtain said casting mould.

3,870,530
CATALYTIC AMORPHOUS GLASS FIBERS

Gordon J. Roberts, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Aug. 9, 1972, Ser. No. 279,211
Int. Cl. C03c *13/00*; **B01j** *11/32, 11/22*
U.S. Cl. 106—50 **10 Claims**

1. An oxidation-inducing, catalytic amorphous glass consisting essentially of an amorphous base glass in highly divided form having a surface area exceeding 0.2 square meter per gram and containing in smelted admixture therewith from about 10% to about 70% by weight of an essentially binary metal oxide system, said system consisting essentially of at least 5% by weight of said glass of CuO and the balance of a metal oxide selected from the group consisting of MnO_2, Cr_2O_3, Fe_2O_3, CoO, NiO, V_2O_5, La_2O_3, CeO_2, ZrO_2, and admixtures thereof.

3,870,531
OPTICAL FLINT GLASS WITH RELATIVELY LOW REFRACTIVE INDICES AND HIGH DISPERSION

Walter Jahn, Ingelheim, Germany, assignor to JENAer Glaswerk Schott & Gen, Mainz, Germany

Filed July 17, 1972, Ser. No. 272,628
Claims priority, application Germany, July 28, 1971, 21377480
Int. Cl. C03c *3/04*
U.S. Cl. 106—52 **5 Claims**

1. Optical flint glass with relatively low refractive indices from nd 1.68 to nd 1.87, a high dispersion from d 30 to d 21, and differing relative partial dispersions consisting essentially on a 100 percent total weight basis of

1. 5-45% by weight of SiO_2
2. 5-27% by weight of K_2O and/or Na_2O
3. 8-40% by weight of Nb_2O_5 and/or Ta_2O_5, said amount being sufficient to stabilize the glass against crystalization without intensifying the yellowish coloring of the glass
4. 15-41% by weight of TiO_2

5. 0-35% by weight of PbO and
6. 0-6% by weight of at least one oxide of the group consisting of WO_3, AS_2O_3 and Bi_2O_3

the maximum content of TiO_2+PbO amounting to not more than 52% by weight and the content of TiO_2+PbO+Nb_2O_5+Ta_2O_5 amounting to 35–70% by weight.

3,870,532

PROCESS FOR THE PRODUCTION OF ALKALI METAL SILICATES

Hanns Biegler, Nagoya, Japan, and Juergen Wiljes, Wesseling, Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfort am Main, Germany

Filed Apr. 18, 1973, Ser. No. 352,395
Claims priority, application Germany, Apr. 21, 1972, 2219503
Int. Cl. C01b *33/32*
U.S. Cl. 106—74 **11 Claims**

1. A process for preparing a composition comprising an alkali metal silicate having an $Me_2O:SiO_2$ ratio of 1:>3.3, wherein Me represents sodium or potassium, said process comprising:

1. heating at boiling for a period of about 90 minutes a mixture comprising a fluorine — containing silicic acid and a concentrated sodium or potassium hydroxide solution, said hydroxide in an amount in excess of the stiochiometric amount required to completely react with the flourine, said silicic acid having a fluorine content of less than 10 weight percent dry basis, a BET — surface area of less than about 100 m^2/g and a free water content less than about 40 weight percent;
2. adding to the resulting hot suspension about 1 – 15 weight percent calcium hydroxide based on the weight of the fluorine — containing silicic acid;
3. heating the resulting mixture from step (2) at boiling for a period of about 60 minutes;
4. adding an additional quantity of the concentrated sodium or potassium hydroxide to the resulting mixture from step (3);
5. heating at boiling the resulting mixture from step (4) for a period of about 3 hours;
6. separating the alkali metal silicate from the hot mixture from step (5).

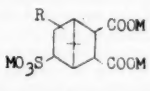
3,870,533

HYDRAULIC COMPOSITION

Shunichiro Ogura, Tokyo, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,062
Claims priority, application Japan, Dec. 8, 1972, 47-12310
Int. Cl. C04b *7/02*
U.S. Cl. 106—90 **2 Claims**

1. A hydraulic composition comprising 100 parts by weight of a hydraulic substance and 0.01 – 5 parts by weight of a 3,6-endomethylene-hexahydro-o-phthalic acid-4-sulfonic acid derivative of the formula



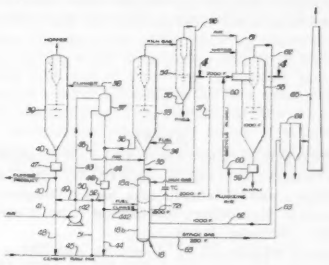
wherein R is a member selected from the group consisting of hydrogen, an alkyl radical of 1 – 4 carbon atoms and the — COOM group, and M is a member selected from the group consisting of hydrogen, an alkali metal atom, a half atom of an alkaline earth metal and the ammonium group, which M may be the same or different.

3,870,534

MAINTENANCE OF HIGH HEAT EXCHANGE TRANSFER RATES AND IMPROVED ALKALI DESUBLIMATION CONDITIONS IN PORTLAND CEMENT PRODUCTION

Edward M. Van Dornick, 1150 Fallen Leaf Rd., Arcadia, Calif. 91006

Filed May 25, 1973, Ser. No. 363,815
Int. Cl. C04b *7/36*
U.S. Cl. 106—100 **13 Claims**



1. In a system for the production of Portland cement wherein gas-entrained raw mix is fed through a heat exchange zone to a calcining zone from which hot clinker and gases are separately discharged and wherein said heat exchange zone comprises multiple vertical tubes through which the raw mix flows in heat transfer relation with hot gases from the calcining zone; the process of maintaining high heat transfer rates from the kiln gases to the entrained raw mix within the heat exchange zone that includes recycling gas-entrained solid clinker particles from the calcining zone and introducing said particles to the raw mix streams flowing through the tubes so that the clinker particles become gas-entrained therewith and exert scouring and cleaning action against the inside surfaces of the tubes.

3,870,535

METHOD OF TREATING COAL MINING REFUSE

Leonard John Minnick, Cheltenham; Charles L. Smith, Conshohocken, and William C. Webster, Norristown, all of Pa., assignors to IV Conversion Systems, Inc., Philadephia, Pa.

Continuation-in-part of Ser. No. 222,384, Jan. 31, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,702
Int. Cl. C04b *7/321*
U.S. Cl. 106—118 **17 Claims**

1. Method of treating sulfuric acid-containing coal mining refuse comprising intimately admixing said refuse, in the presence of water, with lime, the amount of lime exceeding that stoichiometrically necessary to neutralize said sulfuric acid content of said refuse, and permitting said admixture to harden, at atmospheric pressure, for at least several days.

3,870,536

CERAMIC DECALCOMANIA

Louis A. Blanco, Tuckahoe, and Hazel W. Meade, Pleasantville, both of N.Y., assignors to Commercial Decal, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 110,261, Jan. 27, 1971, Pat. No. 3,772,049, which is a continuation-in-part of Ser. No. 727,649, May 8, 1968, abandoned. This application Aug. 15, 1973, Ser. No. 388,375
Int. Cl. C08h *17/34*; **C08b** *27/42*, *27/36*
U.S. Cl. 106—146 **3 Claims**

1. A bonding agent for ceramic decalcomanias, the decalcomania containing a pigment and an organic material, said bonding agent consisting essentially of from about 20 to about

70% of a fast-acting solvent selected to act on the organic material in the decalcomania, said fast-acting solvent being a lower alkyl monoether of a C_2 to C_4 glycol wherein the lower alkyl groups have up to about six carbons, a monohydride alcohol containing up to about six carbons, a C_2 to C_3 ester of acetic acid and/or lactic acid, in admixture with turpentine, and from about 30 to about 70% of a moderating agent selected to moderate the action of the solvent on the organic material, and selected from the group consisting of propylene glycol, butylene glycol, pentylene glycol, hexylene glycol, octylene glycol, decylene glycol, and dodecylene glycol and mixtures thereof and mixtures of one or more thereof with water.

3,870,537

SHAPED SOLID BODY OF PULLULAN ETHER AND METHODS OF MAKING AND USING THE SAME

Hiromi Hijiya, and Makoto Shiosaka, both of Okayama, Japan, assignors to Hayashibara Biochemical Laboratories, Incorporated,, Okayama, Japan

Filed Feb. 25, 1974, Ser. No. 445,092

Claims priority, application Japan, Mar. 1, 1973, 48-23710

Int. Cl. C08b *25/00, 27/42*

U.S. Cl. 106—162 **10 Claims**

1. A shaped, solid body essentially consisting of a lower-alkyl or hydroxy-lower-alkyl ether of pullulan and 0% to 5% of a polyhydric alcohol at least as soluble in water as sorbitol, said lower-alkyl having one to four carbon atoms, and said pullulan having a molecular weight of 10,000 to 5,000,000.

MSC

3,870,538

GYPSUM SET ACCELERATOR

Edward A. Burkard, East Amherst, and Donald A. Kossuth, Buffalo, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed May 7, 1973, Ser. No. 358,191

Int. Cl. C04b *11/14*

U.S. Cl. 106—315 **4 Claims**

1. An accelerator for accelerating the setting reaction of calcium sulfate hemi-hydrate and water consisting essentially of the finely ground product of a compression milling of a mixture of about 1 to 99 percent calcium sulfate dihydrate and about 1 to 99 percent starch.

3,870,539

TEMPORARY PRINTING CARRIERS

Heinz Glaser, Kandern, Germany, and Vassil Zlatareff, Fullinsdorf, Switzerland, assignors to Societe d'Etudes du Procede Noridem, Glarus, Switzerland

Filed Oct. 4, 1972, Ser. No. 297,032

Claims priority, application Switzerland, Oct. 6, 1971, 14481/71; July 28, 1972, 11293/72

Int. Cl. B32b *7/06, 27/10;* **C09j** *7/02*

U.S. Cl. 117—3.1 **13 Claims**

1. A temporary carrier of paper, aluminium, regenerated cellulose, polyester terephalate or polyolefine sheets, or laminates thereof, which carries on one of its surfaces a detachable film of pigmented vinyl resins with a preferably multi-coloured pattern or design, an underlying layer consisting of a mixture of nitrocellulose and an aminoplast or of nitrocellulose and an alkyd resin, wherein there is present on the detachable film a thin adhesive layer containing resins which are soluble in organic solvents and possess a pendulum hardness according to Konig (DIN 53 157) of at least 85 seconds.

3,870,540

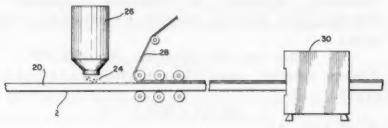
SURFACE TEXTURE FOR FIBROUS BOARDS

Fred C. Norgard, 45 Marie Ave., Somerville, N.J. 08876

Continuation-in-part of Ser. No. 49,325, June 24, 1970, abandoned. This application Apr. 5, 1972, Ser. No. 241,161

Int. Cl. B32b *19/00*

U.S. Cl. 117—16 **5 Claims**



1. A method of texturing the surface of a water-laid lap of entangled fibers comprising:

a. forming a water-laid lap of entangled fibers;

b. substantially uniformly distributing a layer of discrete particles of a foamed synthetic organic thermoplastic resinous materials on one surface of the water-laid lap of entangled fibers such that most of the particles abut one another before pressing the wet lap;

c. pressing the particles into the wet lap to embed the particles in the wet lap; and,

d. heating the wet lap to reduce the volume of the foamed material and leave depressions in the surface which produce a unique random surface texture.

3,870,541

SELECTIVE TRANSFER OF AN ELECTROSTATIC TONER IMAGE

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 221,230, Jan. 27, 1972,. This application Mar. 27, 1973, Ser. No. 345,385

Int. Cl. G03g *13/00*

U.S. Cl. 117—17.5 **8 Claims**

1. Improved methods for transferring all or selected toner images on a photoreceptor to a transfer member, comprising the steps of:

disposing a substantially non-conductive transfer member in a position with respect to a surface portion of said photoreceptor from which a selected toner image may be transferred so that a portion of said transfer member is adjacent to said surface portion of said photoreceptor;

charging at least said portion of said transfer member on a continuous basis with an ion charging source; and

placing at least a lineal segment of the charged portion of said transfer member in a transfer relationship with said surface portion of said photoreceptor from which a selected toner image may be transferred while said portion of said transfer member is being charged by displacing said lineal segment of said transfer member from said adjacent position to said transfer relationship within a time interval which is less than that required by said ion charging source to cause ionization of a gap between said surface portion of said photoreceptor and at least said lineal segment of said transfer member being placed in a transfer relationship therewith.

3,870,542

PROCESS OF TREATING FIBROUS ARTICLES WITH MICROCAPSULES CONTAINING HYDROPHOBIC TREATING AGENT

Syunya Ida, Nara, and Kenjiro Hosokawa, Osaka, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,244, Aug. 19, 1970, abandoned. This application Sept. 26, 1972, Ser. No. 292,414

Claims priority, application Japan, Aug. 22, 1969, 44-66574; Aug. 23, 1969, 44-66786; Aug. 25, 1969, 44-67429; Oct. 15, 1969, 44-82727

Int. Cl. B44d *5/06*

U.S. Cl. 117—33.3 **18 Claims**

1. A process for treating a fibrous article selected from yarns, knitted fabrics, woven fabrics or non-woven fabrics consisting of at least one kind of natural or artifical fibers, comprising the steps of:

1. forming a suspension, in water, of a multitude of discrete microcapsules having particle sizes in the range of 100 to 1 μm, each microcapsule consisting essentially of:
   a. a liquid core consisting essentially of a solution of at least one hydrophobic fiber treating agent dissolved in a non-aqueous solvent which is not miscible with water, said fiber treating agent comprising elasticity-improving agents, antipilling agents, ultra-violet ray absorbers, softening agents, flame proof agents, anti-static agents, water repellent agents, soil-releasing agents, heat proof agents, shrink proof agents, crease proof agents, cross-linking agents, dyes or pigments and being capable of being adhered, absorbed or re-acted with said fibers upon contact therewith, and
   b. a solid, thin synthetic resin shell deposited on and completely surrounding said core, said resin being selected from the group consisting of polyurethane resins, silicone resins, polyolefins, epoxy resins, poly-amides and polyesters, said shell having a breaking tenacity of not in excess of 50 g/cm², the weight ratio of (b) to (a) being in the range of 1 :500 to 1 : 5,000;
2. applying the suspension of said microcapsules in water onto said fibrous article; and
3. breaking the microcapsules on said fibrous article to impregnate said article with said solution whereby said fibrous article is treated by said fiber treating agent.

3,870,543

METHOD OF BONDING HYDROXYQUINOLINE TO AN INORGANIC MATERIAL

Howard H. Weetall, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 9, 1973, Ser. No. 377,626

Int. Cl. B44d *1/20;* **C03c** *17/28*

U.S. Cl. 117—54 **7 Claims**

1. A method of chemically bonding 8-hydroxyquinoline to an inorganic material which comprises the steps of:

a. reacting with an aqueous solution of cyanogen bromide an essentially water-insoluble inorganic material having surface hydroxyl or oxide groups and a surface area of at least 5 M²/gram, the inorganic material being selected from the group consisting of porous glass and zirconia-coated porous glass;
b. removing the material from the solution;
c. reacting the material with a benzidine solution to couple benzidine residues on the surface of the material, said benzidine residues having attached thereto free amino groups;
d. diazotizing the free amino groups; and
e. reacting the material having the diazotized groups attached thereto with an aqueous solution of 8-hydroxyquinoline.

3,870,544

FIBROUS BOARD PRODUCTS HAVING IMPROVED SURFACE

Walter S. Shisko, Ottawa, Ontario, Canada, assignor to Domtar Limited, Montreal, Canada

Filed June 19, 1972, Ser. No. 263,922

Claims priority, application Canada, June 16, 1972, 144986

Int. Cl. B44d *1/092*

U.S. Cl. 117—60 **3 Claims**

1. In a fibrous board made from lignocellulosic fibres and having on at least one surface thereof a coat of water-base resin paint, the improvement for rendering said surface resistant to browning which comprises a coating on said surface underlying said coat of water-base resin paint, said coating consisting of a dried aqueous solution of a water-soluble salt of the group consisting of the chloride, acetate and nitrate of barium, the chloride, acetate and nitrate of strontium, the chloride, acetate and nitrate of calcium, lead nitrate and lead acetate, the concentration of said salt solution being at least 2%.

3,870,545

PROCESS FOR COATING A CATALYST SUPPORT

Joseph A. Tabacek, New Kinsington; Brian W. Taylor, Richland Township, and Roger F. Vogel, Jefferson Township, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 23, 1973, Ser. No. 381,978

Int. Cl. B01j *11/46;* **B44d** *1/44*

U.S. Cl. 117—71 R **24 Claims**

1. A process for applying a high surface area coating to catalyst supports having a low surface area which comprises coating said support with an alumina sol mixture consisting essentially of about 2.6 to about 19 per cent by weight of aluminum, about 1.3 to about 25 per cent by weight of chlorine, about 36 to about 95.7 per cent by weight of water and about 0.4 to about 20 per cent by weight of an amine or consisting essentially of about 2.6 to about 16 per cent by weight of aluminum, about 2.2 to about 37 per cent by weight of nitrate, about 30 to about 94.8 per cent by weight of water and about 0.4 to about 17 per cent by weight of an amine and then calcining said coated support.

3,870,546

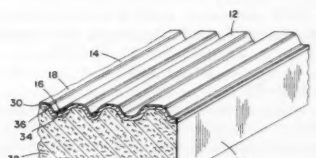
ASBESTOS-CEMENT PRODUCT AND PROCESS

Fred J. Gelsomino, Buffalo, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed Feb. 12, 1973, Ser. No. 331,827

Int. Cl. B32b *13/12;* **B44d** *1/14*

U.S. Cl. 117—72 **10 Claims**



1. The process for manufacturing durable, weather-resistant, non-blocking, non-tacky asbestos-cement products which comprises coating the surface of an autoclave steam-cured asbestos-cement sheet with a water-dispersed pigmented acrylic polymer, drying said coating to a degree such that said coating is substantially dry to the touch but not cured, applying thereover an aqueous coating of an unpigmented mixture of acrylic polymer and polyethylene, said polyethylene comprising at least about 5 percent of the total weight of solids of said mixture, and simultaneously curing

said acrylic and said acrylic-polyethylene mixture to form a tough coating with a surface which is relatively slippery, non-tacky and non-blocking.

3,870,547

STARCH COATED FIBERS FOR EMBEDDING IN RESIN MATRIX FORMING MATERIALS AND COMPOSITES SO FORMED

Gerald B. Workman, Granville, and Lawrence R. Deardurff, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 24, 1974, Ser. No. 436,291
Int. Cl. C03c *25/02, 25/00*
U.S. Cl. 117—72 **11 Claims**

1. In the process for producing glass fiber reinforced plastics wherein essentially bare glass fibers are coated with a size, and are then wound into a package, and following which the fibers are run through machinery and embedded into a liquid resin prepolymer that is cured insitu around the fibers to bond therewith, the improvement comprising: applying starch, emulsified particles of a nonionic lubricant, a water soluble cationic organic lubricant, and an organo-silane coupling agent which couples said liquid resin prepolymer to glass fibers that are devoid of interferring films in a manner causing said organo-silane to treat the glass and form a coating of starch, nonionic lubricant, and cationic lubricant over the organo-silane treated glass fiber surface; dissolving the nonionic lubricants and cationic lubricant out of the coating with a mutual solvent but in which the silane is not dissolvable to expose the silane treated surface of the glass fibers; and bonding a matrix resin prepolymer to the silane treated surface of the glass fibers.

3,870,548

PRIMER COMPOSITION FOR HEAT CURABLE SILICONE

Joseph Eugene Stevenson, Charleston, S.C., assignor to Stauffer Chemical Company, Adrian, Mich.

Division of Ser. No. 241,421, April 5, 1972, Pat. No. 3,769,253, which is a continuation-in-part of Ser. No. 70,196, Sept. 8, 1970, abandoned, which is a continuation of Ser. No. 716,340, March 27, 1968, abandoned. This application July 23, 1973, Ser. No. 381,939
Int. Cl. B44d *1/14*
U.S. Cl. 117—72 **2 Claims**

1. An article of manufacture comprising a substrate and a cured primer composition bonded thereto, said primer composition containing a silicone polymer substantially free of hydroxyl groups and consists of silicon atoms, oxygen atoms and radicals selected from the group consisting of hydrocarbon radicals and halogenated hydrocarbon radicals and has recurring structural units of the formula R''_2SiO in which the ratio of R'' groups to Si atoms is from 1.9 to 2.0 and from 0.01 to about 5.0 mol percent of the R'' groups are unsaturated and the remaining R'' groups are selected from the class consisting of hydrocarbon and halogenated hydrocarbon groups; an organic peroxide catalyst and a silane of the formula

$$R_nSi(OOCR')_{4-n}$$

wherein R is an alkenyl radical having from one to 10 carbon atoms, R' is an alkyl radical having from one to five carbon atoms; and n is a number of from 1 to 2.

3,870,549

INK RECEIVING MATTE SHEET MATERIALS OVERCOATED WITH AN ALKYL MONOESTER OF POLY (ALKYL VINYL ETHER-MALEIC ACID)

Albertus Pieter Ruygrok, Leiden, Netherlands, assignor to GAF Corporation, New York, N.Y.

Filed Feb. 13, 1973, Ser. No. 332,173
Int. Cl. B32b *23/08, 27/36*
U.S. Cl. 117—73 **9 Claims**

1. Improved matte sheet material capable of receiving ink markings comprising a polyester film base at least one surface of which carries a first layer of cellulosic matte film-forming lacquer composition, the surface of said first layer carrying a second layer comprising an alkyl monoester of poly(alkyl vinyl ether-maleic acid).

3,870,550

METHOD OF PREVENTING INGESTION OF LEAD BASE PAINT COATINGS

Seymour Mann, New York, N.Y., assignor to Aceto Chemical Co., Inc., Flushing, N.Y.

Continuation-in-part of Ser. No. 220,410, Jan. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 112,041, Feb. 2, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,623
Int. Cl. C08b *25/00;* **B44d** *1/12*
U.S. Cl. 117—84 **9 Claims**

1. A method of minimizing the danger of ingestion of a lead-base painted coating which coating is harmful when ingested, which comprises applying to a surface coated with a lead-base paint a composition consisting essentially of a solution of sucrose octa-acetate in a solvent selected from the group consisting of methylene chloride, trichlorethylene and isopropyl alcohol, said solution containing a sufficient amount of sucrose octa-acetate to cause the surface to which it is applied to have such bad taste that ingestion of the same is discouraged, whereby said solvent partially dissolves and softens the lead-base paint coated surface and causes said sucrose octa-acetate to adhere to the coated surface and permitting evaporation of the solvent, whereby the sucrose octa-acetate remains adhereing to said surface.

3,870,551

METHOD OF TREATING GLASS FIBERS USING ULTRASONIC VIBRATION

Ichiro Iwami; Tsutomu Matsunaga, and Ken Yoneyama, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 837,730, June 30, 1969, abandoned. This application Aug. 15, 1972, Ser. No. 280,803
Claims priority, application Japan, July 8, 1968, 43-47174
Int. Cl. B01j *1/12;* **C03c** *25/02;* **B44d** *1/44*
U.S. Cl. 117—115 **5 Claims**

1. A method for improving the resistance of a bundle of glass fibers against folding and friction and for improving the adhesivity of a bundle of glass fibers with a rubber by treating a bundle of glass fibers with a resorcin-formaldehyde-rubber latex composition, which comprises;

passing said bundle through a bath of said composition which has a solids content of 5 – 40% by weight and is kept at a temperature of 20 – 80°C, applying an ultrasonic wave having a frequency of 100 – 600 Kc/s uninterruptedly to said bath thereby to accelerate the penetration of said composition between fibers, and

drying the composition treated fibers.

3,870,552

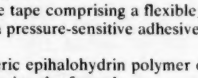
PRESSURE-SENSITIVE ADHESIVE TAPE

Robert H. Hackhel, 414 Hickory, Lombard, Ill. 60148

Division of Ser. No. 205,284, Dec. 6, 1971, Pat. No. 3,808,288. This application Jan. 31, 1974, Ser. No. 438,188
Int. Cl. C09j 7/04
U.S. Cl. 117—122 PF 9 Claims

1. An adhesive tape comprising a flexible backing and supported thereon a pressure-sensitive adhesive consisting essentially of

a. an elastomeric epihalohydrin polymer comprising recurring units having the formula



wherein X is chlorine or bormine and *n* is zero to 2, and

b. a thermoplastic polyketone resin comprising the condensation product of an aliphatic ketone having a total of 3 to 6 carbon atoms; a monoaryl alkyl ketone having from 6 to 10 ring carbon atoms in the aryl group and from 1 to 4 carbon atoms in the alkyl group; an aliphatic ketone having a total of 3 to 6 carbon atoms with a lower aliphate aldehyde; a monoaryl alkyl ketone having from 6 to 10 ring carbon atoms in the aryl group and from 1 to 4 carbon atoms in the alkyl group with a lower aliphatic aldehyde; or a carbocyclic ketone having 3 to 7 ring carbon atoms with a lower aliphatic aldehyde;

said thermoplastic polyketone resin being present in an amount from about 30 to about 150 parts per 100 parts of said epihalohydrin polymer.

3,870,553

CELLULAR CONCRETE UNIT COATED WITH AIR PERMEABLE, WATER REPELLENT CONCRETE COATING

Edward B. Hussey, Beaconsfield, Quebec, Canada, assignor to Domtar Limited, West Montreal, Canada

Continuation-in-part of Ser. No. 152,985, June 4, 1971, abandoned. This application Mar. 30, 1973, Ser. No. 346,703
Claims priority, application Canada, July 8, 1970, 87712
Int. Cl. B32b 13/04; C04b 7/02
U.S. Cl. 117—123 A 6 Claims

1. A precast concrete building unit comprising a lightweight cellular concrete unit having on at least one face thereof and integral therewith a finishing layer of dense, high-strength concrete material, said dense concrete material consisting essentially of an inorganic cementitious binder, a siliceous aggregate containing a coarse fraction and a fine fraction and between 2 and 12 percent solids based on the total weight of said concrete material of a resin binder, said coarse fraction consisting essentially of aggregate substantially all of which passes through a 30 mesh screen and a portion constituting at least 70 percent of said coarse fraction being in the −40 to +100 mesh range, said fine fraction having a particle size such as less than 10 percent of said fine fraction is retained on a −200 mesh screen, said fine fraction constituting between 12 and 40 percent of the total of said portion and said fine aggregate, the weight ratio of said fine fraction to the total of said portion and said fine fraction and the weight ratio of said resin binder solids to said dense concrete material being coordinated thereby to provide a finishing layer having a water repellency greater than 90 percent and a water vapour permeance of between 6 and 12 perms.

3,870,554

THERMAL SHRINKAGE RESISTANCE OF LEATHER

Alfred O. Minklei, Grand Island, and John A. Peterson, Niagara Falls, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 250,208, May 4, 1972, Pat. No. 3,824,124. This application Jan. 2, 1973, Ser. No. 320,339The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.
Int. Cl. C14c 9/00; C09k 3/28
U.S. Cl. 117—138 6 Claims

1. A process for improving the thermal shrinkage resistance of leather which comprises the steps of treating the leather with an aqueous solution of tetrapotassium pyrophosphate at a temperature of from about 20° to 85° C, and thereafter, treating the resulting leather with a solution of a salt of magnesium at a temperature of from about 5° to 85° C, both of said treatments being carried out for a time sufficient to impregnate the leather with at least 0.5 percent by weight of the reaction product of said magnesium salt and said tetrapotassium pyrophosphate metal salt.

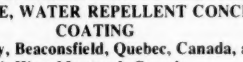
3,870,555

ARYL STEARIC ACID TREATED TEXTILES

Ronald Swidler, Pasadena, Calif.; Ray S. Smith, Greensboro, N.C., and Harry A. Miller, Altavista, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

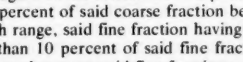
Division of Ser. No. 40,717, May 26, 1970, Pat. No. 3,592,786, which is a division of Ser. No. 683,139, Nov. 15, 1967, Pat. No. 3,521,993, which is a continuation-in-part of Ser. No. 645,599, June 13, 1967, abandoned. This application Feb. 3, 1971, Ser. No. 112,457
Int. Cl. C10m 3/18; D06m 11/02, 13/20
U.S. Cl. 117—138.8 F 8 Claims

1. A process comprising impregnating a textile material with aqueous aryl stearic acid having the formula



wherein R is an aromatic group and isomers thereof wherein the aromatic group is disposed at any point from the second to the seventeenth carbon atoms and thereafter drying the material to remove water retained by said textile material through impregnation with said aqueous aryl stearic acid.

6. A textile material prepared by a process comprising impregnating a textile material with aqueous aryl stearic acid having the formula



wherein R is an aromatic group and isomers thereof wherein the aromatic group is disposed at any point from the second to the seventeenth carbon atoms and thereafter drying the material to remove water retained by said textile material through impregnation with said aqueous aryl stearic acid.

3,870,556
TEXTILE FINISHING COMPOUNDS

Klaus Noll; Gunter Oertel, both of Koeln, and Karl Schafer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 244,200, April 14, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 400,764

Claims priority, application Germany, Apr. 24, 1972, 2120090

Int. Cl. C08h *19/02*

U.S. Cl. 117—141 **4 Claims**

1. A textile, containing keratin fibres, treated with a polyisocyanate having the general formula:

$$A—[O—CO—(O)_n—R—NCO]_m$$

wherein

m is an integer of from 2 to 10;

n is 0 or 1;

A is an m-valent residue having a molecular weight of from about 500 to about 18,000 which residue is free of Zerewitinof-active hydrogen atoms and which is obtained by removal of the hydroxyl groups from a polymer which contains hydroxyl groups; and

R is a divalent aliphatic or cycloaliphatic hydrocarbon radical containing one to 20 carbon atoms to impart shrink-proofing properties to said textile.

3,870,557
TREATMENT OF POROUS WEB STRUCTURES WITH AQUEOUS SUSPENSIONS OF A SYNTHETIC RESIN

Herbert Fink, Bickenbach; Manfred Munzer, Bensheim, and Horst Dinklage, Darmstadt-Arheilgen, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed July 7, 1972, Ser. No. 269,731

Claims priority, application Germany, July 17, 1971, 2135828

Int. Cl. B44d *1/02*

U.S. Cl. 117—161 R **3 Claims**

1. In a process for coating or strengthening a porous web structure by contacting said web with a synthetic resin contained in particulate form in an aqueous medium, the improvement wherein said web structure (1) is contacted with an aqueous suspension, prepared by an aqueous suspension polymerization process, of a synthetic resin having a glass transition temperature below about 35°C., the resin particles in said suspension having an average particle diameter between about 0.05 mm and about 0.5 mm and being present in said suspension in an amount giving a solids content of up to 70 percent by weight, and (2) is then dried at a temperature between about 80°C. and about 180°C., the amount of resin suspension employed being such as to leave between about 10g/m² and about 200g/m² of resin in said web structure after drying.

3,870,558
PROCESS FOR PREPARING A LAYER OF COMPOUNDS OF GROUPS II AND VI

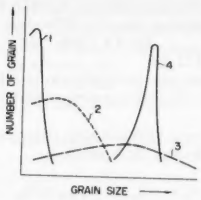
Kazuo Shimizu; Okio Yoshida, both of Yokohama; Kazuo Terakawa, Tokosuka, and Satoshi Aihara, Yokohama, all of Japan, assignors to Tokyo Shibouro Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 172,454, Aug. 17, 1971, Pat. No. 3,793,069. This application June 8, 1973, Ser. No. 368,309. The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl. B44d *1/02*

U.S. Cl. 117—201 **7 Claims**

2. A process for preparing a layer of Group II-VI compound which comprises forming a layer of cadmium selenide on a substrate plate and heat-treating it in an atmosphere comprising an inert gas, 0.1–10% by volume of oxygen on the basis of said inert gas and vapour of sulfur or mixtures of sulfur with



selenium, whereby uniform grain growth with narrow range grain size distribution is effected.

3,870,559
PAPER TREATMENT

Ronald Cowling, and James Nairn Greenshields, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

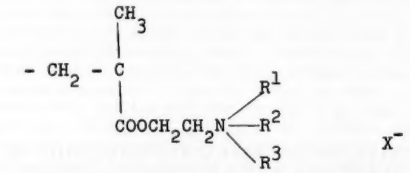
Continuation of Ser. No. 115,844, Feb. 16, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,184

Claims priority, application Great Britain, Feb. 25, 1970, 9115/70

Int. Cl. B44d *1/18;* **G03g** *7/00*

U.S. Cl. 117—201 **3 Claims**

1. A method of improving the electroconductivity of paper which comprises applying to at least one surface of the paper an aqueous solution of a copolymer containing in the molecule 15–80% by weight of repeating units of the formula:



wherein R^1 represents methyl or ethyl, R^2 and R^3 each independently represents methyl or ethyl or R^2 and R^3 taken together represent $—CH_2CH_2OCH_2CH_2—$ or $—(CH_2)_n—$ where *n* represents 4 or 5 and X^- represents a chloride or acetate ion, the remainder of the copolymer consisting of styrene, vinyl toluene, 2-ethylhexyl acrylate or methyl methacrylate units, said copolymer having an average molecular weight in the range 5,000 to 2,000,000.

3,870,560
SILICATE-AND HYDROXIDE-CONTAINING CLEANING COMPOSITIONS, AND LIQUID CONCENTRATES FOR THE PREPARATION THEREOF

Gary Allen Shumaker, Ashtabula, Ohio, assignor to The Lubrizol Corporation, Thickliffe, Ohio

Filed Jan. 2, 1973, Ser. No. 320,343

Int. Cl. C23g *1/14;* **C11d** *3/08*

U.S. Cl. 134—2 **24 Claims**

1. A liquid cleaning concentrate containing at least 20% dissolved solids by weight, which comprises an aqueous solution of about 15–25% of at least one alkali metal hydroxide, about 35–45% of at least one alkali metal silicate, about 1–5% of at least one organic sequestrant, and about 2–15% of at least one anionic surfactant.

18. A method of cleaning a metal object which comprises contacting said object with a composition according to claim **11.**

3,870,561
ELECTRIC ACCUMULATOR

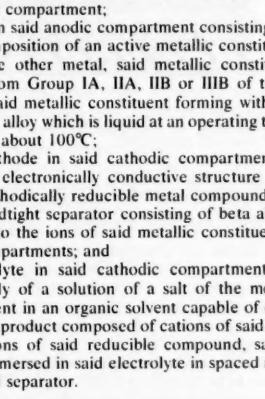
Jean-Claude Charbonnier, St.-Germain-en-Laye, France, and Helmut Tannenberger, Geneve, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation-in-part of Ser. No. 79,204, Oct. 8, 1970, Pat. No. 3,730,771, and a continuation-in-part of Ser. No. 232,798, March 8, 1972, Pat. No. 3,773,558. This application Nov. 17, 1972, Ser. No. 307,560

Claims priority, application Switzerland, Oct. 9, 1969, 15148/69; Mar. 9, 1971, 3400/71. The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl. H01m *35/02*

U.S. Cl. 136—6 LN **14 Claims**



1. An electric accumulator comprising:

a container divided into an anodic compartment and a cathodic compartment;

an anode in said anodic compartment consisting essentially of a composition of an active metallic constituent and at least one other metal, said metallic constituent being taken from Group IA, IIA, IIB or IIIB of the Periodic Table, said metallic constituent forming with said other metal an alloy which is liquid at an operating temperature of up to about 100°C;

a solid cathode in said cathodic compartment having a sintered electronically conductive structure incorporating a cathodically reducible metal compound;

a solid fluidtight separator consisting of beta alumina permeable to the ions of said metallic constituent between said compartments; and

an electrolyte in said cathodic compartment consisting essentially of a solution of a salt of the metal of said constituent in an organic solvent capable of dissolving a reaction product composed of cations of said constituent and anions of said reducible compound, said cathode being immersed in said electrolyte in spaced relationship with said separator.

3,870,562
USE OF $Ni(OH)_2$ IN PRESSED PLATE ELECTRODES

Henry A. Catherino, Gainesville, Fla., assignor to General Electric Company, Owensboro, Ky.

Filed June 17, 1974, Ser. No. 480,017

Int. Cl. H01m *43/04*

U.S. Cl. 136—24 **10 Claims**

1. In a rechargeable cell having an alkali-electrolyte resistant container having at least one insulated terminal thereon, a positive electrode, an alkali electrolyte, and a cadmium pressed negative electrode, the improvement comprising said negative electrode comprising:

a. substrate;

b. a compressed mixture supported on said substrate, said mixture comprising:

1. stabilized cadmium metal generally spherically shaped particles formed by condensing cadmium metal vapors in the presence of oxygen having an average particle size of about 3–12 microns;

2. about 0.01–5% by weight nickel hydroxide powder;

3. a cadmium compound powder selected from the group of CdO, $Cd(OH)_2$, and mixtures thereof;

4. a binder.

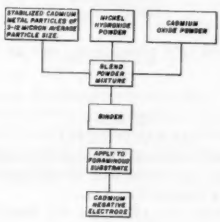
3. A pressed cadmium negative electrode having a substrate, the improvement comprising a compressed mixture supported on said substrate, said mixture comprising:

a. a cadmium compound powder selected from the group of CdO, $Cd(OH)_2$, and mixtures thereof;

b. generally spherically shaped cadmium metal particles having an average particle formed by condensing cadmium metal vapors in the presence of oxygen size of 3–12 microns and stabilized with a minor amount of CdO, said cadmium metal particles comprising not more than 34% by weight of the powder mixture;

c. about 0.01–5% by weight nickel hydroxide powder; and

d. a binder.



7. An improved process for producing a cadmium negative electrode for a rechargeable cell having enhanced anti-fading properties comprising:

a. providing generally spherically shaped particles of stabilized cadmium metal powder formed by condensing cadmium metal vapors in the presence of oxygen having an average particle size of about 3–12 microns and containing about 1% by weight CdO to inhibit oxidation of the metallic powder;

b. mixing together said metallic cadmium powder with nickel hydroxide and a cadmium compound powder selected from the group of CdO, $Cd(OH)_2$, and mixtures thereof to form a mixture containing from not more than 34% by weight metallic cadmium, about 0.1–5% by weight nickel hydroxide, about 60–98% by weight cadmium oxide compound;

c. blending said powder mixture with a binder; and

d. compressing the mixture on foraminous substrate to form an electrode.

3,870,563
HERMETICALLY SEALED STORAGE BATTERY

Samuel Ruben, 53 Seacord Rd., New Rochelle, N.Y. 10801

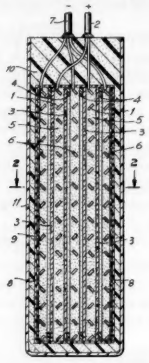
Continuation-in-part of Ser. Nos. 82,701, Oct. 21, 1970, abandoned, and Ser. No. 252,724, May 12, 1972, Pat. No. 3,798,070, and Ser. No. 277,787, Aug. 3, 1972, abandoned, and Ser. No. 293,367, Sept. 29, 1972, abandoned. This application July 16, 1973, Ser. No. 379,443

Int. Cl. H01m *39/00*

U.S. Cl. 136—26 **10 Claims**

1. An electric storage battery having a positive electrode comprising a grid of titanium, a thin layer of nickel on the titanium, a dense layer of lead over the nickel and a coating of lead peroxide on said lead; a negative electrode comprising

a grid of stainless steel, a thin layer of nickel on the stainless steel, a dense plating of lead on the nickel, a porous spongy



coating of lead on said plated lead, and an electrolyte of sulfuric acid.

3,870,564

ALKALINE CELL

Isutomu Takamura, Kawasaki; Yoshimi Kanada, Tokorozawa, and Shintari Suzuki, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd.

Filed Mar. 30, 1973, Ser. No. 346,433
Int. Cl. H01m *43/02*
U.S. Cl. 136—30 **6 Claims**

1. In an alkaline cell comprising:

a. a positive electrode consisting of a positive electrode composition;

b. a separator disposed between said positive electrode and a negative zinc electrode;

c. an alkaline electrolyte as a component of said negative electrode material;

d. a negative zinc electrode comprising a negative electrode material; wherein the improvement comprises said negative electrode material comprising finely divided zinc particles, from 0.1 to 20 percent by wt zinc oxide, a sufficient quantity of an alkaline electrolyte, from 0.05 to 10 10 percent by wt of a gel forming material durable to said alkaline electrolyte, 0.1 to 10 percent by wt of boric acid, its salts or boron oxide, from 0.1 to 20 percent by wt of an inorganic oxide or hydroxide which is stable to said eletrolyte and 0.1 to 10 percent by wt of pulverized cellulose, wherein the metal of said inorganic oxide or hydroxide is less noble than zinc.

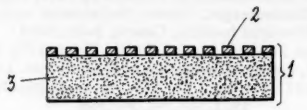
3,870,565

CATHODE FOR THE REDUCTION OF OXYGEN AND A RECHARGEABLE CELL COMPRISING SAID CATHODE

Maurice Bonnemay, 240, bd. Jean-Jaures, Boulogne-Billancourt, Haut-de-Seine; Guy Rene Bronoel, 60, avenue des Etats-Unis, Versailles, Yvelines; Jean-Baptiste Donnet, 29, rue Zwiellem, Didenheim, Haut-Rhin; Jacques Lahaye, 31, rue George Sand, Mulhouse, Haut-Rhin, and Joel Alain Sarradin, 46, avenue de Cressac "commanderie des Templiers", Elancourt, Yvelines, all of France

Filed June 14, 1974, Ser. No. 480,139
Claims priority, application France, June 19, 1973, 73.22182
Int. Cl. H01m *27/04, 35/00*
U.S. Cl. 136—86 A **6 Claims**

1. A cathode for the reduction of oxygen and especially for a rechargeable cell, comprising a support on which is placed an electrochemical catalyst consisting of finely-divided carbon, wherein said carbon is of the non-porous carbon-black type constituted by a chain of substantially spherical particles and having a specific surface within the range of 50 to 600



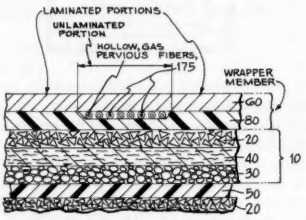
m^2/g, said carbon black having been subjected to a thermochemical treatment in a chlorine atmosphere at a temperature within the range of 1500° to 3000°C.

3,870,566

BATTERY HAVING VENTING PASSAGEWAY OUTSIDE OF OR IN GAS-PERVIOUS LAYERS

Bernard C. Bergum, and Tor Oppedal, both of Madison, Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 3, 1973, Ser. No. 421,159
Int. Cl. H01m *1/06*
U.S. Cl. 136—111 **19 Claims**



1. An improvement in a battery having

a. at least one cell comprising

i. a positive electrode,

ii. a negative electrode, and

iii. a electrolyte-containing layer separating the two electrodes, and

b. a cell terminal member in contact with the outside face of one of the end electrodes and providing a terminal therefor, the cell terminal member comprising an electrically conductive, liquid impervious plastic inner layer which is pervious to the gases generated by the cell,

wherein the improvement provides a gas-venting passageway, the passageway comprising

c. a hollow fiber made from a material which is pervious to the gases to be vented from the cell, the fiber being situated beyond the inside face of the gas-pervious inner layer so that gases generated by the cell must first pass through the inner layer before reaching the fiber, the hollow interior of the fiber communicating with the exterior of the battery.

3,870,567

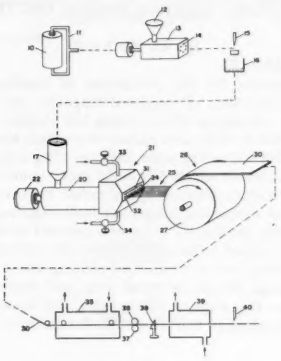
BATTERY SEPARATOR MANUFACTURING PROCESS

Nigel Innes Palmer, Lexington, and Nathan Sugarman, Needham, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 21, 1972, Ser. No. 317,487
Int. Cl. H01m *3/00*
U.S. Cl. 136—148 **8 Claims**

1. A method for producing a battery separator using nonwoven fibers formed from a polymeric resin having a degree of undesirable hydrophobia, solid below 180°F, extrudable as a hot melt and resistant to degradation by at least either acids or alkalies comprising forming a mixture of said polymeric resin and wetting agent, the wetting agent being included in an

amount of 0.5 – 20 percent by weight based on the weight of the resin with said amount being (a) incompatable with the resin below the resin's melting point such that the wetting agent will bloom over a period of time at ambient temperatures in a battery yet (b) compatable with the resin at the



extrusion temperature; extruding said mixture as a hot plastic through a die opening and forming a fiber containing said wetting agent therein; forming said fiber into a web comprising other like fibers; developing said wetting agent by heating said fiber and forming said battery separator.

3,870,568

HEAT GENERATOR

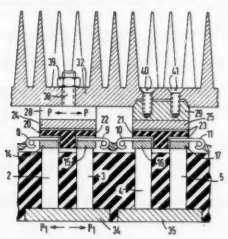
Gerhard Oesterhelt; Josef Winkler, both of Nurnberg; Dieter Falkenberg, Erlangen, and Eugen Szabo de Bucs, Bubenruth, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 290,161, Sept. 18, 1972, abandoned, and a continuation-in-part of Ser. No. 38,766, May 19, 1970, abandoned. This application Feb. 28, 1974, Ser. No. 447,010

Claims priority, application Germany, May 24, 1969, 1926645

Int. Cl. H01z *1/30*

U.S. Cl. 136—212 **6 Claims**



1. A heat generator for converting heat energy into electrical energy, comprising a plurality of thermoelements with two thermoelement legs of opposite conductivity type of germanium-silicon alloy connected electrically in series and thermally in parallel, each of said thermoelement legs having a hot end and a cold end with the cold end being connected in electrical insulation and thermal conductivity with one another and with a cold heat exchanger, a pair of first metal layers contacting each of said cold ends of said thermoelements, one of said pair of said first metal layers having electrical terminals, rigid coupling means coupling said pair of first metal layers to said cold heat exchanger in electrically insulating and thermally conducting relation, said coupling means including a ceramic plate and a second metal plate, a metal layer on both sides of said ceramic plate, said ceramic plate having one of its metal layer sides facing said thermoelements and affixed to one of said pair of first metal layers, and said second metal plate bridging the cold ends of the legs and affixed to the other of the metal layer sides of said ceramic plate, said second metal plate and the part of said pair of first metal layers which contacts said thermoelements being of the same material selected from the group consisting of tungsten and molybdenum.

3,870,569

PROCESS FOR BORIDING REFRACTORY METALS AND THEIR ALLOYS

Harald Krzyminski, Koenigstein, Germany, assignor to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed May 14, 1973, Ser. No. 360,190

Claims priority, application Germany, May 25, 1972, 2225378

Int. Cl. C23f *7/00*

U.S. Cl. 148—6 **12 Claims**

1. A process for boriding a refractory metal consisting essentially of annealing amorphous boron powder in an oxygen-free vacuum and then packing the refractory metal in the oxygen-free amorphous boron powder and boriding the metal in a vacuum at an elevated temperature.

3,870,570

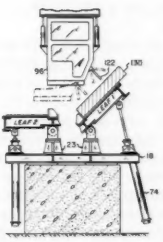
METHOD FOR CONDITIONING METAL SLABS

Arthur H. Fieser, P.O. Box A, Allison Park, Pa. 15101, and Loreley S. Mobley, 4420 Sebald Dr., Franklin, Ohio 45005

Division of Ser. No. 305,794, Nov. 13, 1972, Pat. No. 3,829,072. This application Oct. 3, 1973, Ser. No. 403,116

Int. Cl. B23k *7/02*

U.S. Cl. 148—9.5 **1 Claim**



1. A method for scarfing metal slabs comprising:

A. delivering a slab to a first rotatable slab support means from a first direction;

B. inclining said slab upon said first support means to expose the top surface of said slab;

C. longitudinally traversing said top surface of said slab with a scarfing torch to selectively condition said top surface of said slab;

D. transferring said slab from said first slab support means to a second rotatable slab support means;

E. inclining said slab upon said second support means to expose the bottom surface of said slab;

F. longitudinally traversing said bottom surface of said slab with said scarfing torch to selectively condition said bottom surface of said slab; and

G. discharging said slab from said second slab support means in a direction opposite from said first direction.

3,870,571
METHOD FOR SURFACE TREATMENT OF INTERMEDIATE PRODUCTS WHICH ARE BEING FLAME SCARFED

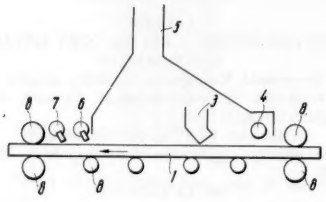
Karl Monreal, Angermund, and Rudolf Schwitzgobel, Krefeld-Traar, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 31, 1973, Ser. No. 411,225

Claims priority, application Germany, Jan. 31, 1973, 2305285

Int. Cl. B23k *7/06*

U.S. Cl. 148—9.5 **9 Claims**



1. In a method for flame scarfing the surface of an intermediate product, wherein the product is subjected to a flame followed by wetting the surface with water, the improvement comprising a step, succeeding the wetting, of blowing the surface by means of an air jet until completely dried.

3,870,572
PROCESS FOR NITRIDING UNALLOYED OR LOW-ALLOY STEEL

Hans Brugger, and Helmut Mallener, both of Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrechshafen AG., Friedrechshafen, Germany

Filed Apr. 26, 1973, Ser. No. 354,731

Claims priority, application Germany, Apr. 29, 1972, 2221169

Int. Cl. C23c *11/16, 11/18*

U.S. Cl. 148—16.5 **6 Claims**

1. A process for nitriding a body of low-alloy or non-alloyed steel which comprises treating said body in a first stage for a period of about 2 hours to 8 hours at a temperature of about 650° C, said temperature being above the α–γ transformation temperature in the iron-nitrogen system, in an ammonia-containing gas and sufficient to effect nitrogen diffusion into at least a surface zone of said body; thereafter slowly cooling said body; and subsequently treating said body with an ammonia-containing gas stream at a temperature of about 570°C for a period of 2 to 4 hours, said temperature being below the α–γ transformation point, to effect equalization in said zone, the gas stream in said first stage having a residual ammonia content of at least 10% by volume and the gas stream in said second stage having a residual ammonia content of 45 to 60% by volume.

3,870,573
SCALE MODIFIER FOR PHOSPHATE SOLUTIONS

Colin Smith, Brentford, England, assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Feb. 4, 1974, Ser. No. 439,671

Claims priority, application Great Britain, Feb. 9, 1973, 6551/73

Int. Cl. B23k *35/22;* **C23f** *7/08*

U.S. Cl. 148—22 **3 Claims**

1. In an aqueous acidic phosphating composition containing scale forming metal ions the improvement comprising including at least 0.0005% of a naphthalene sulfonic acid/formaldehyde condensation product or a salt thereof.

3,870,574
TWO STAGE HEAT TREATMENT PROCESS FOR THE PRODUCTION OF UNALLOYED, COLD-ROLLED ELECTRICAL STEEL

Mihaly Stefan; Zoltan Hegedus; Fulop Balazs, and Gyula Juhasz, all of Budapest, Hungary, assignors to Csepeli Femmu, Budapest, Hungary

Filed Oct. 5, 1972, Ser. No. 295,250

Claims priority, application Hungary, Oct. 21, 1971, CE 854

Int. Cl. H01f *1/00*

U.S. Cl. 148—122 **2 Claims**

1. A process for the production of unalloyed electrotechnical steel strip of improved magnetic and mechanical properties, consisting of hot rolling low carbon steel having not more that 0.10 percent carbon to produce hot-rolled strip covered with hot-rolling scale, then covering said scale with a layer of a member selected from the group consisting of alkali metal hydroxide, alkaline earth metal hydroxide, alkaline earth metal carbonate, aluminum hydroxide and a mixture thereof, then heating the strip with covered scale to 700° to 950°C. for a time sufficient to reduce the carbon content to not more than 0.01 percent, then pickling and cold rolling to its final gauge the decarburized strip, and thereafter heating the strip in a first stage to 350° to 600°C. for about 2 hours and in a second stage to 600° to 780°C. for about 0.5 hour.

3,870,575
FABRICATING A GALLIUM PHOSPHIDE DEVICE

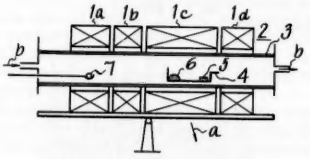
Masashi Dosen, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 342,371, March 19, 1973, abandoned. This application June 25, 1973, Ser. No. 373,449

Claims priority, application Japan, Mar. 21, 1972, 47-28285

Int. Cl. H01b *7/38*

U.S. Cl. 148—171 **12 Claims**



1. A method of fabricating a gallium phosphide device comprising the steps of:

a. providing a substrate of N-type gallium phosphide;

b. forming a melt of gallium-gallium phosphide solution including a P-type impurity, said impurity having a concentration that maintains approximately equilibrium with that of the ambient vapor phase; and

c. growing a P-type epitaxial layer on said substrate from said melt, said impurity concentration therein being not more than $n_d/2.486\ k \times 10^{-20}$ mol % wherein n_d (cm^{-3}) is the carrier concentration in said substrate and k is a distribution coefficient of said impurity.

3,870,576

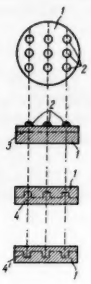
METHOD OF MAKING A PROFILED P-N JUNCTION IN A PLATE OF SEMICONDUCTIVE MATERIAL

Ilya Leonidovich Isitovsky, 15 Parkovaya ulitsa, 43, korpus 2, kv. 39, and Grigory Avrumovich Zelikman, ulitsa Alexeya Tolstoga, 26, kv. 27, both of Moscow, U.S.S.R.

Continuation of Ser. No. 32,870, April 29, 1970, abandoned. This application Feb. 23, 1973, Ser. No. 335,157

Int. Cl. H01l 7/34

U.S. Cl. 148—188 3 Claims



1. A method of diffusion forming a profiled p-n junction in a plate of semiconductive material, comprising: covering a surface of the plate with a solution of a first substance to be diffused and drying the applied solution; selectively applying by the use of a mask, a patch of a protective material in accordance with a predetermined profile, the protective material not dissolving in the solvent of said solution of a first substance; applying on the layer of the first substance to be diffused, having a layer of protective material thereon, a solution of a second substance to be diffused which does not affect the layer of protective material; drying the applied solution of the second substance; removing the protective layer by subjecting the semiconductive plate to a solvent which does not dissolve the first and second substances; and subjecting the semiconductive plate to thermal treatment to form the required profiled p-n junction by diffusing said first and second substances.

3,870,577

PROCESS FOR MAKING WHISKER-LIKE CRYSTALS OF AMMONIUM PERCHLORATE

Marian E. Hills, China Lake, and William M. Ayres, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1970, Ser. No. 79,680

Int. Cl. C06b 11/00

U.S. Cl. 149—2 4 Claims

1. A process for producing whisker-like crystals of ammonium perchlorate which comprises the following steps:

a. providing a quantity of a solution of ammonium perchlorate;

b. providing a porous glass tube;

c. rubbing a thin, uniform film of silicone adhesive onto the outside walls of said tube; and

d. feeding said solution into said tube under ambient conditions;

whereby diffusion of said solution through said walls produces whisker-like crystals which grow so long as said solution diffuses through the walls of said tube.

3,870,578

POLYURETHANE PROPELLANT

Peter L. Nichols, Jr., Sacramento, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 24, 1962, Ser. No. 212,762

Int. Cl. C06d 5/06

U.S. Cl. 149—19.4 12 Claims

1. A polyurethane propellant composition comprising

a. an oxidizing salt, selected from the group consisting of ammonium nitrate and ammonium perchlorate,

b. a polymeric diol having the formula

$$HO-(\overset{R}{C}H-CH_2-O)_nH$$

where R is selected from the group consisting of CH_3- and O_2NOCH_2-,

c. 2, 4-toluene diisocyanate,

d. a trihydroxy alcohol,

e. a catalyst from the group consisting of cobaltic acetyl acetonate, cobalt naphthenate, and ferric acetyl acetonate, and

f. a plasticizer selected from the group consisting of dioctyl azelate and dioctyl sebacate--;

3,870,579

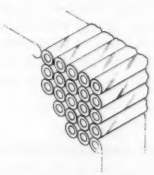
METHOD OF MAKING A PERFORATE WAFER FROM FILAMENTARY MATERIAL

Richard Danby Uncapher, San Fernando, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,525

Int. Cl. B65h 81/00

U.S. Cl. 156—174 7 Claims



1. The method of making a perforate wafer, said method comprising the steps of: laying a thin flexible tube on a drum, rotating the drum, and simultaneously moving it axially to wind said tube in a helix on said drum; blowing the last turn being wound approximately at its initial point of contact with the drum against the next turn adjacent thereto; cutting each turn of said tube off of said drum by cutting each turn in a direction approximately perpendicularly to the tube axis and along a line extending lengthwise along the drum axis; laying the severed turns flat in predetermined positions such that each severed turn has a surface contiguous to the other severed turns immediately adjacent thereto, each severed turn being contiguous to at least one other severed turn, all the axes of said severed turns being substantially parallel and lying in a single plane; bonding the most contiguous surfaces of each severed turn to the other contiguous surfaces of the others contiguous thereto in said predetermined positions; cutting said bonded turns perpendicularly to the axes thereof to provide smaller sheet-like sections, each section having a set of parallel tube axes; bonding the said sections together into a laminate in a manner such that a plane through all the tube axes of one section is substantially parallel to each corresponding plane through the axes of the other sections, all of said tube axes being parallel; cutting said laminate in a direction transverse to said tube axes to provide thin wafers, said

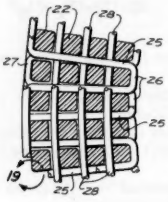
wafers being perforate by virtue of the holes in the severed tubing.

3,870,580

METHOD OF MANUFACTURING OF A FIBER REINFORCED STRUCTURE AND METHOD OF MANUFACTURE

Jack T. Belcher, 1100 E. Sahara Ave., Las Vegas, Nev. 89105

Division of Ser. No. 118,708, Feb. 25, 1971, abandoned. This application May 4, 1973, Ser. No. 357,448
Int. Cl. B29h *9/04*
U.S. Cl. 156—181 **5 Claims**



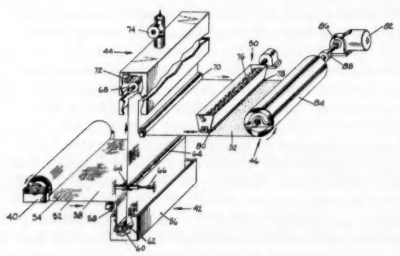
1. The method of making a high strength fiber reinforced structure, comprising the steps of:
   arranging a plurality of bundles, of reinforcing fibers, in spaced, generally parallel relation and in a pattern defining a plurality of channels between said bundles with a first set of parallel channels transversely intersecting a second set of parallel channels;
   securing said bundles, at one end thereof, in said described spaced relation and rendering each bundle sufficiently rigid to be self-supporting;
   substantially filling said sets of channels with additional bundles of reinforcing fibers arranged in layers with the bundles of adjacent layers extending alternately along said first and second sets of channels; and
   encasing all said fibers in an initially fluid bonding agent, then solidifying said agent to form said structure.

3,870,581

FRICTION ELEMENT AND METHOD OF MAKING SAME

Frank D. Afflerbach, Levittown, Pa.; Irvin Barnett, Martinsville, and Walter B. Peters, South Orange, both of N.J., assignors to Johns-Manville Corporation, New York, N.Y.

Filed May 10, 1972, Ser. No. 252,119
Int. Cl. B65h *54/00;* **B31c** *13/00*
U.S. Cl. 156—192 **11 Claims**



1. A method of making a friction element comprising:
   a. forming a fabric consisting essentially of glass having warp strands and fill strands;
   b. impregnating said glass fabric with a curable cement;
   c. winding said glass fabric onto a mandrel to form a spirally wrapped hollow cylinder;
   d. slicing said cylinder into disc preforms, each of said discs having a series of spirally wound, continuous, parallel strands of glass fiber extending in a circumferential direction thereof and a series of parallel strands of glass fiber disposed normally of the faces of said disc to provide frictional properties thereto, each of said disc preforms having an axial thickness substantially less than the annular width thereof; and
   e. molding said disc preforms under heat and pressure to form friction elements containing glass fiber

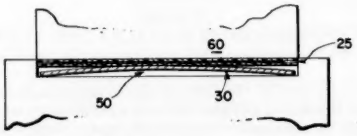
2. The method of making a friction element as defined in claim 1 further comprising distributing non-ferous metal chips over said glass fabric prior to winding said glass fabric onto the mandrel.

3,870,582

NOVEL LAMINATING SYSTEM

Robert D. Brackett, Wakefield, and Paul A. Plasse, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 5, 1972, Ser. No. 295,203
Int. Cl. C09j *9/00;* **B32b** *31/00*
U.S. Cl. 156—306 **8 Claims**



1. In a system for the heat lamination of I.D. cards or I.D. credit cards including means to restrain a laminar assembly during heat lamination thereof and wherein said laminar assembly comprises an information storage medium interposed between protective sheet materials at least one of which provides means for viewing said information and wherein at least one of said sheet materials has an adherent capability integrated therewith and wherein said system includes means for applying sufficient heat and pressure to laminate said assembly, the improvement wherein pressure distribution means which comprises a deformable element which is arcute along both the longitudinal and latitudinal axis are arranged in relation with said laminar assembly to distribute pressure applied to said assembly as said assembly is heated so that initially said pressure is applied to a preselected portion of the assembly and as further pressure is applied, the area of the assembly to which pressure is applied is progressively increased until pressure is applied substantially uniformly to all portions of said assembly.

3,870,583

PRE-FORMED, MULCH CARPET AND APPARATUS AND METHOD FOR MAKING SAME

Lester Gidge, Nashua, N.H., assignor to Terra-Tex Corporation, Nashua, N.H.

Division of Ser. No. 160,425, July 7, 1971, abandoned. This application Apr. 17, 1973, Ser. No. 352,040
Int. Cl. B29b *1/12*
U.S. Cl. 156—500 **11 Claims**

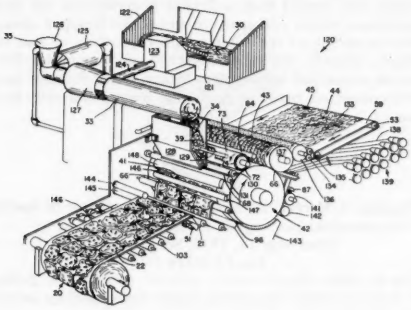
1. Apparatus for making elongated webs of artificial mulch material from wood bark, said apparatus comprising:
   means for grinding redwood bark into particles, drying said particles and delivering the same to a charring oven
   charring oven means for heating said particles to a predetermined temperature;

conveyor means advancing along a path from a feeding zone, through a heating zone and a molding zone into a discharge zone;

hopper means in said feeding zone for continuously receiving said charred, ground particles and metering a mixture of said particles and a plastic binder onto said conveyor;

heating means along said path, in said heating zone, for activating said plastic binder to form a heated, semicohesive layer of said mixture;

molding means along said path in said molding zone, including a rotatable, hard, pocketed pattern roll forming a nip



with a hard pinch-off roll, for pressing said layer into an irregular, grooved, random pattern on one face to simulate natural mulch the pockets of said roll having rims therearound;

means for supplying a strong, non-tearable backing of relatively high tensile strength to said molding zone;

compression roll means along said path for pressing said strong, non-tearable backing on the other face of said molded mulch layer; and

stripping means along said path in said discharge zone for stripping said web from said moving pocketed surface.

3,870,584

AUTOMATIC DOUBLE-SIDE ADHESIVE DEVICE FOR BANDS OR WEBS

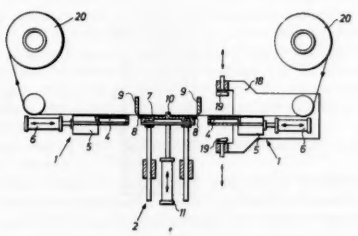
Willi Jores, Opladen; Franz Hoffacker, Langenfeld, and Helmut Lehmann, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 17, 1973, Ser. No. 352,015

Claims priority, application Germany, Apr. 22, 1972, 2219826

Int. Cl. B31f *5/00*

U.S. Cl. 156—505 **9 Claims**



1. An apparatus for joining two elongated webs end-to-end to each other comprising a pair of web supplies for feeding the two webs together in substantial abutment end-to-end in a plane, an adhesive tape dispenser having a pair of spaced adhesive tape supplies disposed above and below the abutting ends of the webs for feeding a pair of adhesive tapes in mutually adhesive contact with each other in the plane of abutment of the webs, traversing means connected to the adhesive tape dispenser for moving it laterally across the abutting ends of the webs, a pair of pressure rollers on the dispenser disposed immediately above and below the plane of the abutting ends of the webs and plane of contact of the adhesive tapes which adhesively join the ends of the adhesive tapes in a joint end, a clamp on the adhesive tape dispenser having gripping jaws disposed above and below the plane of the abutting ends of the webs and in line with the contacting surfaces of the pressure rollers whereby the clamp grasps the joint ends of the adhesive tapes fed from the adhesive tape supplies between the pressure rollers and through them in a direction disposed away from the abutting ends of the webs whereby the joint ends are securely engaged in the clamp, an anchor on the clamp for holding it and the clamped joint ends of the tapes and restraining them against movement toward the abutting ends of the webs as the traversing means moves the adhesive tape dispenser and adhesive tape supplies across both sides of the abutting ends of the webs with the pressure rollers passing forcefully against opposite surfaces of the abutting ends of the webs whereby lengths of tapes are applied above and below the abutting ends of the webs to join them together without pulling the webs to one side, and final cutting means for severing the ends of the applied adhesive tapes at the sides of the abutting ends of the webs which they have joined together.

3,870,585

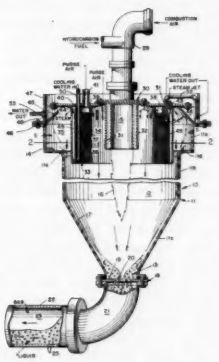
APPARATUS AND METHOD FOR EVAPORATIVE CONCENTRATION OF AQUEOUS SOLUTIONS AND SLURRIES

Tommy Carter Kearns, Lisle, and Donald A. Stoltenberg, Park Ridge, both of Ill., assignors to Pureco Systems, Inc., Rosemont, Ill.

Filed Feb. 15, 1973, Ser. No. 332,596

Int. Cl. B01d *1/22, 1/16;* **F26b** *3/12*

U.S. Cl. 159—4 A **33 Claims**



15. The method of recovering inverse solubility inorganic salts from water solutions, characterized by the combination of steps comprising:

a. introducing and flowing a water solution of the inverse solubility inorganic salt to be recovered downwardly over the interior wall surfaces of a wet-wall evaporator, said solution being introduced into the upper portion of said evaporator;

b. directing a stream of hot combustion gas downwardly within said evaporator between the wet walls thereof, said hot gas stream radiating heat directly to the flowing solution on said walls for evaporation of water therefrom;

c. thereafter turbulently intermixing said heated solution with said combustion gases to transfer sensible heat from said gases to said solution for further evaporation of water, part of the dissolved inorganic salt being converted to precipitated solids by the said evaporations;

d. separating the cooled gases from the residual solution containing said precipitated solids;

e. recycling to said evaporator in admixture with fresh solution at least part of said residual solution containing suspended solids and repeating steps a and d therewith to produce additional precipitated solids; and

f. separating at least part of said solids from at least part of said residual solution to obtain recovered solid product of said inorganic salt;

g. maintaining in said upper portion of said evaporator on the walls thereof a circumferentially extending zone having its lower portion in contact with said introduced solution and its upper portion substantially out of contact therewith;

h. introducing water vapor into the upper portion of said evaporator to maintain a high humidity atmosphere therein adjacent said circumferential zone; and

i. cooling said circumferential zone to condense said water vapor on said exposed upper portion thereof and to maintain said solution-contacted lower portion at a temperature below that of said introduced solution.

26. A direct heat exchange evaporator for evaporative concentration of water solutions, including vertically-extending wall means enclosing an evaporator chamber, the lower portion of said chamber having an outlet; liquid feed inlet and distributor means in the upper portion of said chamber arranged to distribute the water feed solution to be concentrated around the inside surfaces of said wall means to continuously wet said surfaces below said feed inlet and distributor means with downwardly flowing liquid, said liquid exiting through said chamber outlet; and tubular hot gas supply means centrally located in the upper portion of said chamber and extending downwardly therein to direct a stream of hot gas downwardly through said chamber in heat radiation relation with inner walls thereof and exiting through said chamber outlet; wherein the improvement comprises: said evaporator chamber wall means including upper and intermediate portions of circular cross-section, the said upper portion being of larger diameter than said intermediate portion and being connected thereto by an inwardly extending ledge portion of generally annular configuration, said liquid feed means being arranged to introduce said feed onto said ledge portion for distributing flow therearound, the inner corner portions of said ledge connecting with said intermediate chamber portion for providing smooth continuous flow of said feed downwardly over the inner wall surfaces of said intermediate chamber portion, baffle wall means disposed around said tubular hot gas supply means in outwardly spaced relation thereto and extending downwardly to at least the level of the said ledge portion of said feed inlet distribution means while being spaced inwardly therefrom, said baffle wall means providing both a liquid splash shield and heat radiation shield to prevent feed liquid from splashing onto said tubular gas supply means and heat from being radiated from said tubular means directly on said feed inlet and distribution means, and liquid-gas intermixing means disposed across the path of flow of said exiting liquid and hot gas for producing a turbulent intermixture thereof, said intermixing means comprising liquid vortex creating venturi means maintaining a swirling vortex of liquid in the lower portion of said chamber immediately above said venturi means.

3,870,586
DECORATIVE FLOWER

Christopher W. Backus, 26 W. Golden St., Beverly Hills, Lecanto, Fla.

Filed May 14, 1973, Ser. No. 359,882
Int. Cl. A41g *1/00*
U.S. Cl. 161—30 **5 Claims**

1. An artificial flower comprising: stem means including a first attachment means, leaf means including a second attachment means, said first attachment means comprising aperture means formed in said stem means, said second attachment means comprising tab means integrally attached to said leaf means and formed from a flexible material, said tab means positioned within said aperture means and wrapped about at least a portion of the outer peripheral surface of said stem means, whereby said leaf is secured to said stem means; flower means connected to said stem means, a first fastener means interconnected between said stem means and said flower means.

3,870,587
ICE FLOOR

Franklin O. Merrell, Yorba Linda, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed May 14, 1973, Ser. No. 359,880
Int. Cl. B32b *5/18*
U.S. Cl. 161—37 **2 Claims**

1. A removable load-bearing panel for a sub-floor over ice, comprising:

a. a sheet metal top surface,

b. a rigid lower surface,

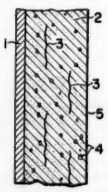
c. a heat-insulating core of plastic foam bonded between said surfaces,

d. a wooden frame bonded between said surfaces and to the outer edges of said core, said frame having flat smooth outer sides whereby a plurality of panels can be placed contiguous to each other to form a floor, and including panel handling means provided in the outer sides of said frame, said handling means being hand holds for lifting and placement of said panel.

3,870,588
METHOD OF CONSTRUCTING A HEAT INSULATING WALL OF FOAMED SULFUR

Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefield Gas Company, Ltd., Tokyo, Japan

Filed Mar. 9, 1973, Ser. No. 339,659
Claims priority, application Japan, Mar. 13, 1972, 47-25488
Int. Cl. B32b *5/18*; **B29h** *7/20*; **B32b** *3/26*; **B65d** *25/18*; **B29d** *27/00*; **B32b** *5/16*
U.S. Cl. 264—42 **7 Claims**



1. A method of constructing a heat insulating wall of foamed sulfur which comprises blowing, in the form of a layer, melted sulfur containing a foaming agent to the inner surface of an outer vessel of a rigid structure, said sulfur foaming and solidifying upon its application to said surface to form a substantially continuous wall.

3,870,589
CARBON-FLUOROCARBON FIBER-PLASTIC COMPOSITE BEARING

Samuel M. Shobert, 17760 Dragoon Trail, Mishawaka, Ind. 46544

Filed July 20, 1973, Ser. No. 381,219
Int. Cl. F16c *13/02, 37/00*
U.S. Cl. 161—47 11 Claims

1. A low-friction bearing comprising a body of self-supporting, hardened plastic having at least two adjacent laminations of fibrous material securely imbedded therein, one of said laminations having a bearing surface and including fibers arranged in layer form of fluorocarbon resin secured in place by said plastic, portions of said fibers being exposed through said plastic to define said bearing surface, the other of said laminations being a rigid backing for said one lamination and including a mass of adjacent fibers in layer form of carbon secured in place by said plastic, said mass of carbon fibers and plastic together forming said rigid backing which serves as a support for said one lamination, said carbon fibers being adjacent to said layer of fluorocarbon resin thereby providing thermal conductivity between fibrous layers.

3,870,590
NON-FLAMMABLE POLYESTER TEXTILE ARTICLES AND METHODS FOR MAKING THEM

Melvin D. Hurwitz, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 21, 1974, Ser. No. 435,351
Int. Cl. D03d *1/00*
U.S. Cl. 161—92 16 Claims

1. A non-flammable polyester textile comprised of

A. 65 to 95 percent by weight of polyester fibers and

B. 5 to 35 percent by weight of fibers of a halogen containing polymer selected from the group consisting of polymers of vinyl chloride, vinylidene chloride, vinyl fluoride, vinylidene bromide and tetrafluoroethylene, coated or bonded to each other with from about 5 to 50 percent by weight, based on the weight of fibers, of a copolymer of

a. from about 60 to 90 percent by weight of one or more chlorine containing monomers selected from the group consisting of vinyl chloride, vinylidene chloride or a mixture thereof;

b. from about ½ to about 5 percent by weight of N-methylolacrylamide, N-methylolmethacrylamide, N-methylol-4-pentenoguanamine or mixtures thereof;

c. up to 5 percent by weight of other comonomers containing a reactive hydrogen;

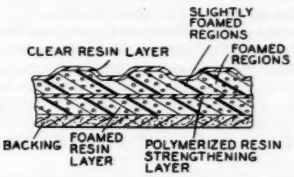
d. from about 9.5 to about 40 percent by weight of an alkyl acrylate, alkyl methacrylate, vinyl acetate, styrene, acrylonitrile or mixtures thereof; and

up to about 10 parts by weight of a flame retardant synergist per hundred parts of fiber.

3,870,591
DIMENSIONALLY STABLE, FLEXIBLE PLASTIC SURFACE COVERINGS

Jack H. Witman, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 266,585, June 27, 1972, Pat. No. 3,819,438. This application Jan. 25, 1974, Ser. No. 436,468
Int. Cl. B32b *3/26*
U.S. Cl. 161—119 5 Claims

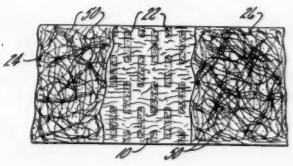


1. A flexible, dimensionally stable, plastic surface covering comprising upper and lower foamed vinyl resin layers, an unfoamed, intermediate, reinforcing layer of vinyl resin containing, polymerized cross-linked monomer, and a vinyl resin top coat.

3,870,592
LAMINATES CONTAINING OUTER PLIES OF CONTINUOUS FILAMENT WEBS

Robert J. Brock, and David W. Hudson, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 14,930, Feb. 27, 1970, abandoned. This application Apr. 27, 1972, Ser. No. 247,962
Int. Cl. B32b *5/12, 5/26, 7/24, 31/12, 31/06*
U.S. Cl. 161—148 8 Claims



1. An absorbent, substantially opaque nonwoven material having desirable isotropic strength characteristics and simulating in hand and feel a woven cloth or fabric comprising, in combination,

a. a web of cellulose wadding having a basis weight of about 0.3 — about 0.7 oz./yd.^{2},

b. disposed on either side of said cellulose wadding, a low basis weight nonwoven web of substantially continuous and randomly deposited, molecularly oriented filaments of a hydrophobic thermoplastic polymer, each of said webs having a basis weight of up to about 0.7 oz./yd.^{2} and the filaments thereof having a denier of about 0.5 — about 6, and

c. patterned areas of adhesive disposed between said webs which penetrate into said cellulose wadding web at spaced open areas in a manner so as to provide delamination resistance in combination with fabric-like flexibility, the placement of said nonwoven webs on either side of said web of cellulose wadding providing a desirable degree of wrinkle recovery and permitting the material to be washed several times without deterioration thereof.

6. An absorbent, substantially opaque nonwoven material having desirable isotropic strength characteristics and simulat-

ing in hand and feel a woven cloth or fabric comprising, in combination,

a. a web of cellulose wadding having a basis weight of about 0.3 — about 0.7 oz./yd.^{2},

b. disposed on either side of said cellulose wadding, a low basis weight nonwoven web of substantially continuous and randomly deposited, molecularly oriented filaments of a hydrophobic thermoplastic polymer selected from polyolifins, polyurethanes, polyvinyls, polyamides and polyesters, each of said webs having a basis weight of up to about 0.7 oz./yd.^{2} and the filaments thereof having a denier of about 0.5 — about 6, and

c. spaced areas of adhesive occupying less than about 25% of the area of cellulosic web and penetrating each surface of said cellulosic web and the adjacent nonwoven webs to bond the webs together, the placement of said nonwoven webs on either side of said cellulose wadding web providing a desirable degree of wrinkle recovery and permitting the material to be washed several times without deterioration thereof.

3,870,593

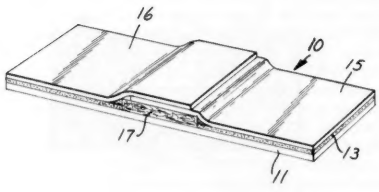
STRETCH-ORIENTED POROUS FILMS AND PREPARATION AND USE THEREOF

Robert L. Elton, White Bear Lake, and John F. Vander Louw, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 260,321, June 6, 1972, Pat. No. 3,844,865. This application Apr. 29, 1974, Ser. No. 465,273

Int. Cl. B32b *3/00*; **B29c** *17/02*

U.S. Cl. 161—159 **6 Claims**



1. A stretch-oriented, elastomeric, porous polyurethane film less than 80 mils in thickness having a void volume of about 5 – 60 volume percent, said void volume being in the form of an interconnecting network of voids, said voids averaging about 3 – 250 microns in their longest dimension, said polyurethane film having been stretch-oriented at a stretch ratio of at least 1.5:1 in at least one direction, thereby being enlarged in area to at least 1.5 times as large as the original area and thereby being decreased in thickness, said polyurethane film containing 5 to 60 percent by volume of an inorganic water insoluble pore nucleating agent distributed throughout said interconnecting network of voids and being smaller in average size than the said average size of said voids, said polyurethane film having a moisture vapor transmission value of at least 500microgram/cm^{2}hr for a relative humidity difference on opposite sides of said polyurethane film of no less than 100/60 percent.

6. A first aid dressing comprising a film according to claim 1 laminated to an absorbent pad.

3,870,594

LAMINATED METAL-BASED FACING

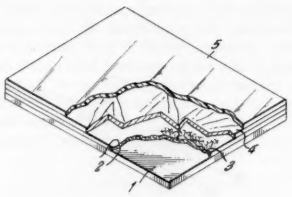
Shinji Kudo, Osaka, Japan, assignor to Yodogawa Steel Works, Limited, Osaka-shi, Japan

Filed Aug. 11, 1972, Ser. No. 279,930

Claims priority, application Japan, Aug. 16, 1971, 46-62219; Mar. 24, 1972, 47-30151

Int. Cl. B32b *5/00, 15/14, 21/08*

U.S. Cl. 161—165 **8 Claims**



1. A laminated metal-based facing capable of being bent without cracking or separating due to the bending and useful as an interior finishing or building material, said facing having as base a metal sheet, a resin adhesive layer on the metal sheet and a veneer of natural wood over the resin adhesive layer, said metal sheet, resin adhesive layer and natural wood veneer being laminated together under heat and pressure, and said resin adhesive layer being nonwoven cloth of nonbinder construction obtained from synthetic resin fiber and impregnated with a thermoplastic phenolic resin adhesive having less than 60 mol % of phenol resin groups which is flexible and adheres to the metal sheet.

7. A laminated metal-based facing capable of being bent without cracking or separating due to the bending and useful as an interior finishing or building material, said facing having as base a metal sheet, a resin adhesive layer on the metal sheet and a veneer of natural wood over the resin adhesive layer, said metal sheet, resin adhesive layer and natural wood veneer being laminated together under heat and pressure, and said resin adhesive layer being nonwoven cloth of nonbinder construction obtained from synthetic resin fiber and impregnated with a thermoplastic phenolic resin adhesive having less than 60 mol % of phenol resin groups which is flexible and adheres to the metal sheet and a flexible film of synthetic resin paint on said veneer.

3,870,595

PROTECTION OF TURBINE CASINGS

Peter Frederick Hawthorne, Nechells, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Division of Ser. No. 77,348, Oct. 1, 1970, Pat. No. 3,752,683. This application Jan. 29, 1973, Ser. No. 327,650

Claims priority, application Great Britain, Oct. 6, 1969, 49044/69; July 2, 1970, 32217/70

Int. Cl. B32b *7/02, 15/04*

U.S. Cl. 161—166 **15 Claims**

1. A composite layered article, consisting essentially of two layers having different densities, each layer of which is a refractory heat insulating material comprising a dry composition consisting essentially of an inorganic refractory fibre and a water-soluble binding agent, said refractory fibre and binding agent being present in a homogeneous relationship and each of said layers further having uniform hardness, strength and density across the thickness thereof.

8. A composite layered article comprising one layer which is the casing of a turbine engine and another layer which is a shaped casing liner of refractory heat insulating material comprising a dry composition consisting essentially of an inorganic refractory fibre and a water soluble inorganic binding agent, said refractory fibre and binding agent being present in a

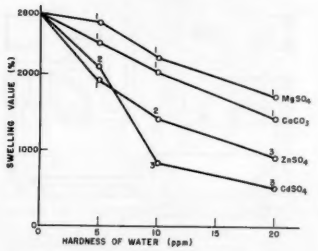
homogeneous relationship and said liner further having uniform hardness, strength and density across the thickness of the liner.

3,870,596

PROCESS FOR THE PREPARATION OF DISPERSION WATER FOR INCOMPLETELY REGENERATED CELLULOSE SUBSTANCE

Takashi Asadea, and Shin Okamoto, both of Kyoto-fu, Japan, assignors to Tachikawa Research Institute, Kyoto, Japan

Filed June 22, 1971, Ser. No. 155,429
Int. Cl. D02g *3/00;* **G32b** *7/00*
U.S. Cl. 162—157 C **1 Claim**



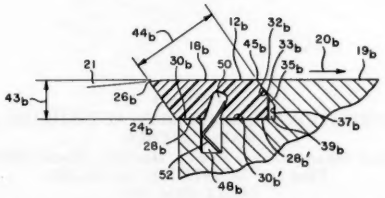
1. In a process, wherein paper or non-woven fabric is manufactured in the wet process by dispersing into dispersion water an incompletely regenerated cellulose substance having a PSV of **250 – 10,000** percent which is prepared in the spinning of a viscose having a high viscosity and a high gamma value, the steps of introducing a water softener in the dispersion water to bring it substantially to zero hardness and then adjusting the hardness of the water to **0.5 – 100** ppm by adding one or a combination of Mg, Ca, Zn and Cd inorganic salts to the water.

3,870,597

DRAINAGE FOIL HAVING A FOIL BLADE INSERT

Darryl L. Getman, South Beloit, and Marshall G. Swenson, Rockford, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 256,471, May 24, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,628
Int. Cl. D21f *7/00*
U.S. Cl. 162—352 **11 Claims**



1. An elongated drainage foil for removing liquid from a contiguous drainage wire traveling in a given direction on a web making machine, the foil extending transversely to the direction of wire travel when in operating position, comprising:

a. a body member having top and leading edge surfaces extending along the length thereof and having a coextending groove in the intersection of said top and leading edge surfaces, said groove having just two mounting surfaces which are inclined one to the other;

b. a foil blade insert member polyhedron disposed within said groove having abrasion resistant leading and top bearing surface faces forming a leading edge toward the oncoming traveling wire direction, said top bearing surface face being flush with said top surface and positionable against the wire, and having just two inclined mounting surfaces engaged with respective ones of said groove mounting surfaces;

c. resilient means interposed between said body and foil blade members within the groove urging said foil blade member against said body member in the direction of wire travel, thus cooperating with the two mounting surfaces to provide the sole means of attaching the foil blade insert member to the body member.

3,870,598

INFLUENZAL VACCINE FOR PERORAL ADMINISTRATION AND A METHOD OF PRODUCING SAME

Alexandra Konstantinovna Alexeeva, Obolensky pereulok, 9, korpus 6, kv. 24; Ljudmila Alexandrovna Yakovleva, ulitsa Vostrukhina, 6, korpus I, kv. 5I; Irina Nikolaevna Vasilieva, Novo-Ostapovskaya ulitsa, 12a, kv. 8; Otar Georgievich Andzhaparidze, Sadovo-Sukharevskaya, 8/12, kv. 43, and Angelina Nikolaevna Alexandrova, ulitsa 1812 goda, 1, kv. 139, all of Moscow, U.S.S.R.

Filed Apr. 1, 1971, Ser. No. 130,482
Int. Cl. C12k *7/00*
U.S. Cl. 195—1.5 **5 Claims**

1. A method of preparing an influenzal virus for peroral administration as a vaccine which comprises adding to a culture medium containing sources of carbon, nitrogen, glucose and mineral salts a disintegrated nephric tissue obtained from chick nephrocytes from chick embryos at least 17 days-old up to chickens at most 3 weeks-old, and an apathogenic influenza virus strain adapted to a culture of chick nephrocytes cultivating the resulting mixture at a temperature of 34°–38°C for a period of 48–120 hours, and isolating the desired product.

3,870,599

MICROBIAL DEGRADATION OF PETROLEUM

Edward N. Azarowicz, Vienna, Va., assignor to Bioteknika International, Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 43,226, June 3, 1970, Pat. No. 3,769,164. This application Feb. 20, 1973, Ser. No. 333,706
Int. Cl. C12b *1/00*
U.S. Cl. 195—2 **9 Claims**

1. A process for the microbial degradation of aqueous polluting petroleum and oily wastes which comprises treating the petroleum or oily waste with at least one microorganism selected from the group consisting of *Candida parapsilosis* ATCC 20246, *Candida tropicalis* ATCC 20247 and *Candida utilis* ATCC 20248, and mutants thereof, in an aqueous system for a sufficient time until the treated petroleum oily waste has been substantially degraded.

3,870,600

SELECTIVE AND ENRICHMENT MEDIUM FOR THE ISOLATION IDENTIFICATION AND PROPAGATION OF YEASTS AND FUNGI

Kamal Abdou Youssef, 233 74th St., Brooklyn, N.Y. 11209

Continuation of Ser. No. 129.256, March 29, 1971, abandoned. This application June 25, 1973, Ser. No. 373,185
Int. Cl. C12b *1/00;* **C12k** *1/06*
U.S. Cl. 195—81 **2 Claims**

1. A selective and enriched composition for the isolation, identification and propagation of yeasts and fungi in presence of bacteria which comprises an aqueous extract of the pulp of the ripe fruit of the tree *Cassia fistula that contains* 1,8,dihydroxy-anthraquinone-3-carboxylic acid and an anthraquione substance having a melting point of about 250°C. a nitrogen source and sugar.

3,870,601

NOVEL DIAGNOSTIC SYSTEM FOR DIFFERENTIATION OF ENTEROBACTERIACEAE

Bert Warren, Tuxedo Park, N.Y., and George L. Evans, Hopatcong, N.J., assignors to Schering Corporation, Bloomfield, N.J.

Filed May 4, 1973, Ser. No. 357,318
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R **18 Claims**

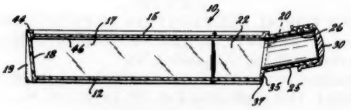
1. A culture medium having a pH in the range of about 6.7–7.2 suitable for determining the identification of bacteria of the family Enterobacteriaceae which comprises a chromogenic β-galactosidase substrate in combination with a member of the group consisting of (a) a decarboxylase substrate, (b) a deaminase substrate, (c) a urease substrate, (d) a hydrogen sulfide detecting system, or (e) a carbohydrate fermentation system.

3,870,602

GAS PERMEABLE STERILE CULTURE BOTTLE

Seymour Froman, Northridge, and William L. Chandler, Altadena, both of Calif., assignors to California Laboratory Industries, Inc., North Hollywood, Calif.

Filed Apr. 30, 1973, Ser. No. 355,754
Int. Cl. C12b *1/00*
U.S. Cl. 195—139 **10 Claims**



1. A sterile, disposable culture bottle for growth of microorganisms in a controlled environment of a gas and water vapor comprising: an elongated flask-like member including a bottom wall and a spaced top wall; side walls integral with said bottom wall and defining therewith and with said top wall a flask of unitary structure; one of said side walls including a neck integral with said side arranged at an upwardly inclined angle with respect to said bottom wall, all of said walls and said neck being inseparably secured to each other, said neck having a free end to receive a cap sealably engaging said neck to prevent passage of microorganisms therethrough; said walls of said flask being of an impact resistant plastic material permeable to said gas and water vapor, but impermeable to microorganisms; said top wall being essentially flat, transparent and optically distortion free so as to permit microscopic examination of the culture within said flask, and means on said bottle for maintaining said bottom wall spaced from a supporting surface.

3,870,603

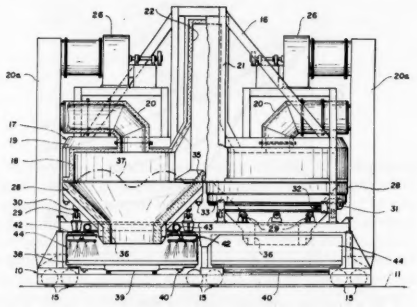
Patent Not Issued For This Number

3,870,604

MOBILE ROTARY TYPE CONTINUOUS COKE QUENCHER

Charles R. Wilt, Jr., Upper Saint Clair, Pa., assignor to Salem Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1972, Ser. No. 292,963
Int. Cl. C10b *39/14*
U.S. Cl. 202—227 **11 Claims**



1. In a mobile rotary type coke quenching apparatus having a dual bin structure, the improvement comprising a pair of rotary hoppers respectively forming part of the individual bins of said dual bin structure, motor means for concurrently rotating said rotary hoppers in opposite directions, a wedge element of inverted V-shape in cross-section located between the upper inlet openings of said pair of rotary hoppers, and a common inlet with which said wedge element is in centered alignment and through which heated coke is pushed and deposited principally on said wedge element.

3,870,605

COMBINATION SOLAR AND MANUAL DISTILLER AND RAIN CATCHER

Minoru Sakamoto, 3911 Nioi Pl., Honolulu, Hawaii 96816

Filed Jan. 24, 1973, Ser. No. 326,400
Int. Cl. B01d *3/08*
U.S. Cl. 202—234 **10 Claims**

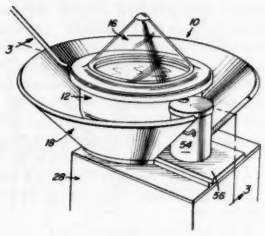
1. Apparatus, comprising, in combination:

a. a container provided with a fluid receiving and discharging opening;

b. a base member having a planar portion provided with a hole, and a frusto-conical wall diverging from the planar portion and arranged partially around same; and

c. a cover including a hollow cone having an open base and an open apex, the container being arrangeable on the base member over the hole provided therein, and the open base of the cover being arrangeable on the con-

tainer about the opening of same for the cover forming a condensation surface over the container opening, the base member, cover, and container cooperating to form



a still, and the apex of the cover arrangeable for fitting in the hole in the base member and forming a fluid ctacher in cooperation with the base member.

3,870,606

PROCESS FOR PREPARING HEAVY WATER FROM SEA WATER

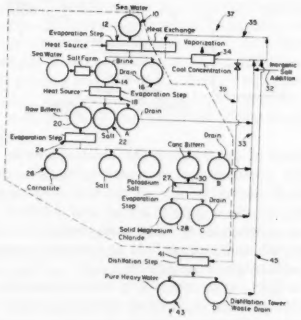
Hisanobu Tabata; Norimasa Tabata, both of 968, Kou, Ohgoshi-machi, and Robkuo Nakajima, 1831, Ohyabu-cho, all of Sakaide-shi, Kagawa-ken, Japan

Continuation of Ser. No. 47,992, June 22, 1970, abandoned. This application May 26, 1972, Ser. No. 257,352

Claims priority, application Japan, June 26, 1969, 44-50501; Aug. 18, 1969, 44-65148

Int. Cl. B01d *1/00, 3/00*

U.S. Cl. 203—5 **1 Claim**



1. A process for preparing heavy water from sea water which comprises adding 0.1–10.0 percent, calculated as Mg^{++} ion of a soluble halide salt to a mixture of drains produced by the evaporation of sea water in a conventional process for the manufacture of common salt, warming the mixture of drains between room temperature and 40°C using the heat energy from the salt manufacturing process, concentrating the warmed mixture of drains to a heavy water content of about 1 percent by exposing large surface areas of the warmed mixture to the atmosphere, removing the added halide salt from the concentrated mixture by evaporating the mixture, and collecting the condensate from the evaporation step and subjecting the condensate to distillation to yield a high concentration heavy water.

3,870,607

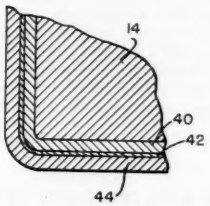
BEARING MANUFACTURE

Herbert Bardach, Danbury, Conn., assignor to Avco Corporation, Stratford, Conn.

Division of Ser. No. 136,083, April 21, 1971,. This application July 10, 1972, Ser. No. 270,355

Int. Cl. C23b *5/48, 5/46, 5/50*

U.S. Cl. 204—15 **6 Claims**



1. A method of manufacturing a bearing, said bearing being coated with silver with at least one radioactive atom species embedded in the coating at a particular depth, the amount of radioactive species in said coating being insufficient to affect the properties of the silver coating when it functions as an antifriction bearing silver coating and yet being an amount sufficient to be detected in the silver coating wear particles carried away by lubricant when the radioactivated silver incorporated in the silver coating is being worn away, said method comprising:

depositing a relatively thin layer of non-radioactive silver on a base metal;

masking portions of said layer thereby defining at least one wear receiving surface;

electrodepositing an extremely thin layer of silver doped with at least one radioactive atom species to said wear receiving surface;

removing the mask from the resulting article; and

thereafter depositing a relatively thick layer of silver on said article.

3,870,608

PROCESS FOR COLORING ALUMINUM OR ALUMINUM ALLOYS BY ANODIZING WITH IMPERFECTLY RECTIFIED CURRENT

Ikuo Mita, Tokyo, Japan, assignor to Tokyo Metropolitan Government, Tokyo, Japan

Filed May 14, 1973, Ser. No. 359,645

Claims priority, application Japan, May 18, 1972, 47-48621

Int. Cl. C23b *9/02*

U.S. Cl. 204—58 **6 Claims**

1. A process for coloring an article of aluminum or alloys of aluminum comprising anodizing the article in a sulfuric acid electrolytic solution containing at least one ingredient selected from the group consisting of SeO_4^{2-}, MoO_4^{2-}, WO_4^{2-}, TeO_4^{2-}, CrO_4^{2-}, CrO_7^{2-}, AsO_3^{3-}, AsO_4^{3-}, VO_4^{3-}, sulfates, nitrates, phosphates, sulfamates, borates, chromates, dichromates, chlorides, silicates, oxalates, malonates, tartarates, and succinates of nickel, cobalt, tin, copper, lead, titanium, cad-

mium, iron, molybdenum, zirconium and manganese by subjecting the article to imperfectly rectified current having a ratio of positive component to negative component of at least 2:1, the current density of the positive component being approximately 0.5 to 6.0 A/dm² and that of the negative component being approximately 0.05 to 6.0 A/dm², the amount of the ingredient in the sulfuric acid electrolytic solution being approximately 0.1 to 200 g./1.

3,870,609

IRRADIATED INSOLUBLE AMYLOSE STARCH

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 822,763, Jan. 23, 1969, abandoned, which is a division of Ser. No. 455,771, May 14, 1965, Pat. No. 3,468,777. This application Jan. 25, 1971, Ser. No. 109,590The portion of the term of this patent subsequent to Sept. 23, 1986, has been disclaimed.

Int. Cl.² C08b *1/00*

U.S. Cl. 204—160.1 **10 Claims**

1. A method for increasing the insolubility of starch having a high amylose content comprising

a. intimately contacting said starch with water and then

b. irradiating said starch to a dosage of less than 10 megarads and sufficient to increase the insolubility of the starch in boiling water to at least 20 per cent and to yield an irradiated starch of at least about 20 per cent amylose content.

3,870,610

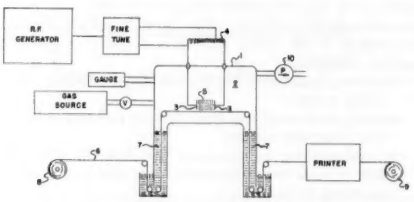
COLD PLASMA TREATMENT OF MATERIALS

Richard W. Baird, and William G. Baird, Jr., both of Spartanburg, S.C., assignors to W. R. Grace and Co., Duncan, S.C.

Continuation-in-part of Ser. No. 233,278, March 9, 1972, abandoned. This application Feb. 27, 1973, Ser. No. 336,287

Int. Cl. C08f *47/22*; **H01t** *19/00*

U.S. Cl. 204—165 **9 Claims**



1. A process for treating polymeric materials comprising the steps of:

a. evacuating a confined region to a pressure less than 100 torr;

b. creating and maintaining a cold plasma within said region, the ionized species comprising said plasma being created within said region and not being transported therefrom; and,

c. exposing at least one side of said material directly to said plasma within said region.

3,870,611

PROCESSING OF COAL TO PRODUCE LIQUID AND VAPOROUS HYDROCARBONS

George W. Vestal, Rt. 4, Box 238, Denton, Tex. 76201

Filed Oct. 19, 1973, Ser. No. 407,969

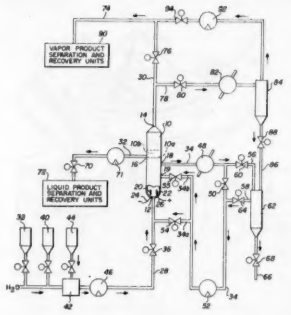
Int. Cl. B01k *1/00*

U.S. Cl. 204—168 **17 Claims**

9. A process of converting coal to lower molecular weight hydrocarbons comprising:

a. suspending coal particles within an aqueous stream;

b. passing said aqueous stream containing said suspended coal particles into a liquid aqueous medium contained within a reaction zone and heating said coal particles between spaced electrodes as they are passed into said liquid aqueous medium to cause decomposition of at least



a portion of said coal particles and form said lower molecular weight hydrocarbons;

c. passing said lower molecular weight hydrocarbons through said liquid aqueous medium; and

d. recovering said lower molecular weight hydrocarbons from said liquid aqueous medium.

3,870,612

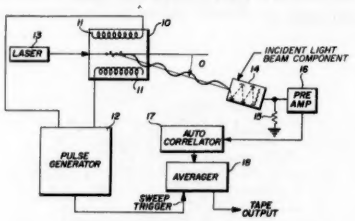
ANALYSIS FOR POLYMER MIXTURES IN SOLUTION UTILIZING ELECTROPHORETIC LIGHT SCATTERING APPARATUS

Willis H. Flygare, Urbana, Ill., and Bennie R. Ware, Arlington, Mass., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 309,272, Nov. 24, 1972, Pat. No. 3,766,048. This application Aug. 2, 1973, Ser. No. 385,055

Int. Cl. B01k *5/00*

U.S. Cl. 204—180 R **4 Claims**



1. A method of determining the electrophoretic mobility and diffusion coefficient of a macromolecular polymer in solution, which method comprises the following steps:

establishing an electric field across said solution to move said macromolecules through said solution in a direction parallel with said electric field at a velocity proportional to said electrophoretic mobility;

applying a light beam comprising monochromatic electromagnetic radiation incident on said macromolecules;

detecting said light beam scattered by said macromolecules;

heterodyning said detected scattered light beam with said incident light beam to produce beat frequency signals; and

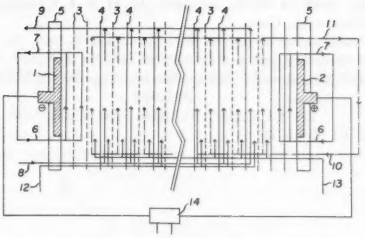
analyzing said beat frequency signals to determine the Doppler shift of said scattered light beam which is reprsentative of said electrophoretic mobility and to determine the

frequency distribution of said scattered light beam which is representative of said diffusion coefficient.

3,870,613
PROCESS FOR THE REMOVAL OF MINERAL SALTS FROM MILK

Tsutomu Nakamura, Tokyo; Kensuke Itoh, Sayama; Hajime Murata, Kawagoe; Makoto Ishikawa, Hokkaido; Eiichi Furuichi, Kawasaki; Yasuhiro Arakawa, Gunma-ken; Shinichi Taneya, Tachikawa; Hiroji Motomura, Shinnanyo; Katsutoshi Yoshimoto, and Hisao Tomokawa, both of Tokuyama, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Higashi-ku, Sapporo-shi, Hokkaido and Tokuyama Soda Kabushiki Kaisha, Tokuyama-shi, Yamaguchi-ken, both of, Japan

Filed Feb. 28, 1974, Ser. No. 446,730
Claims priority, application Japan, Mar. 12, 1973, 48-28060
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P **15 Claims**



1. A process for the removal of mineral salts from milk or milk products of aqueous liquid by ion exchange membrane electrodialysis apparatus having dilution compartments and concentration compartments which comprises dispersing gas bubbles continuously or intermittently into the above said milk or its products in the dilution-compartments, while simultaneously passing the above said milk or its products through said dilution compartments at a linear velocity of above 5 cm./sec. and reversing the polarities of the electrodes intermittently.

3,870,614
SELENIUM DEPOSITION

John Duckles Underwood, Bishop Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 476,986
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **8 Claims**

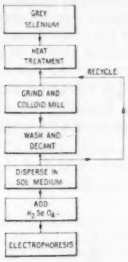
1. A method of electrophoretically depositing selenium comprising:

colloid milling selenium with a liquid containing an antiflocculation agent to a particle size suitable for forming a sol;

washing the particles;

dispersing the particles in a liquid to form a sol;

adding a trace of selenic acid; and

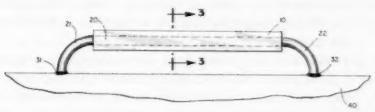


applying an electric field between electrodes immersed in the sol to deposit selenium on the cathode.

3,870,615
SACRIFICIAL ANODE

Fred V. Wilson, and Henry J. Leblanc, Sr., both of Port Arthur, Tex., assignors to Standard Brass and Manufacturing Company, Port Arthur, Tex.

Continuation of Ser. No. 214,207, Dec. 30, 1971, abandoned.
This application Oct. 1, 1973, Ser. No. 402,360
Int. Cl. C23f *13/00*
U.S. Cl. 204—197 **2 Claims**



1. A sacrificial anode structure comprising:

a. a one-piece pipe core of 4-inch Schedule 80 steel pipe having an elongated straight central section and 90° arcuate sections at each opposite end of said straight section, the radius of curvature of said arcuate sections being about four times the diameter of the pipe core;

b. and a body of sacrificial anode material surrounding and supported by the elongated straight central section of said pipe, said central section of said pipe emerging from opposite ends of the body of anode material.

3,870,616
CURRENT CONTROLLED REGULATION OF GAS EVOLUTION IN A SOLID POLYMER ELECTROLYTE ELECTROLYSIS UNIT

Russell M. Dempsey, Hamilton; Mary E. Nolan, Marblehead; Anthony B. La Conti, Lynnfield, and Robert A. Torkildsen, Danvers, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Jan. 2, 1973, Ser. No. 320,165
Int. Cl. B01k *3/00, 3/10*
U.S. Cl. 204—230 **4 Claims**

1. In a gas generator having a controllable gas output the combination comprising:

a. an electrolysis cell having:

1. a solid polymer, ion-exchange electrolyte membrane,
2. catalytic electrodes positioned adjacent to opposite surfaces of said membrane to dissociate a chemical compound to evolve gas,

b. a source of electrical power coupled to the electrodes of said cell,

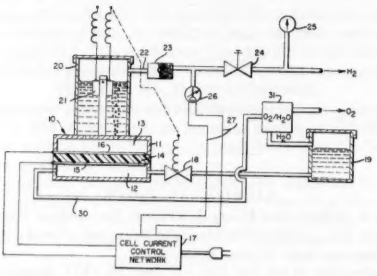
c. means to furnish a chemical compound to one of said electrodes for dissociation, the ionic form of one of the

elements of the dissociated compound being transported across said ion-exchange-membrane to evolve the gas,

d. means for sensing the output gas pressure and producing a control signal in response thereto;

e. means responsive to the control signal responsive to the sensed gas pressure for controlling the current flow from said source of electrical power on a time ratio basis to vary the current level to the cell electrodes thereby to control the rate of gas evolution including:

1. a current source including a pair of alternately conducting solid state switching devices for supplying the cell current,



2. a voltage responsive variable repetition frequency, pulse generator coupled to said switching devices having a voltage responsive timing network for controlling the repetition pulse frequency, said pulse generator producing triggering pulses for said switches to control the average current level to said cell,

3. means coupling the signal from said gas pressure sensing means to said pulse generator timing network to vary the pulse repetition rate of the pulses from said generator in response to said signal to vary the cell current as a function of the outlet gas pressure.

3,870,617

APPARATUS FOR FORCED FLOW ELECTROPHORESIS

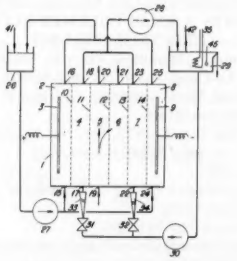
Guy Bourat, Bourg-la-Reine, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 238,764, March 28, 1972, Pat. No. 3,829,370. This application Feb. 15, 1974, Ser. No. 443,158

Claims priority, application France, Mar. 30, 1971, 71.11180

Int. Cl. B01d *13/02*

U.S. Cl. 204—301 **2 Claims**



1. A forced flow electrophoresis cell for the continuous fractionation of an aqueous liquid containing colloidal compounds which are mobile in an electric field into one fraction enriched and one fraction depleted in at least one of the compounds, said cell comprising an anode and a cathode, a plurality of spaced apart ion-permeable membranes dividing said cell into six compartments, including two end compartments containing said anode and cathode respectively, two intermediate compartments and two central compartments, the membrane separating said two central compartments being a microporous membrane the membranes separating said central compartments from the intermediate compartments being dialysing membranes, and the membrane separating the intermediate compartments from the end comparjments containing the anode and the cathode being impermeable respectively to anions and cations, means for feeding the liquid to be fractionated under pressure to one of said central compartments, means to withdraw a filtered portion of the liquid from the other central compartment and the remaining unfiltered portion from said one central compartment, means for feeding a main electrolyte to and from the end compartments and means for feeding an auxiliary electrolyte to and from the intermediate compartments, whereby the average pH of one stream of the auxiliary electrolyte between its introduction and removal from the cell differs from the said average pH of the second stream of the auxiliary electrolyte.

3,870,618

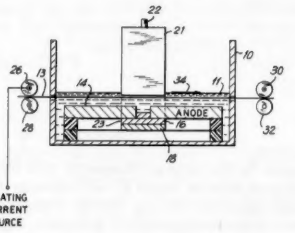
CHROMIUM PLATING METHOD

Edgar J. Seyb, Jr., Oak Park, and Richard E. Woehrle, Berkley, both of Mich., assignors to M & F Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 202,648, Nov. 26, 1971, abandoned, which is a division of Ser. No. 869,343, Oct. 24, 1969, abandoned. This application Aug. 30, 1973, Ser. No. 392,952

Int. Cl. C23b *5/58*; **B60l** *9/00*; **C23b** *5/06*

U.S. Cl. 204—28 **2 Claims**



1. In a method of electroplating a bright protective chromium plate which comprises maintaining a chromium plating bath containing chromic acid and sulfate; maintaining an anode in said bath; passing through said bath continuously moving continuous strip of thin-gauge metal; passing an electric current through said anode, said bath, and said cathode thereby electroplating a bright protective plate on said moving strip of thin-gauge metal whereby said strip of metal is maintained as cathode, the improvement comprising preventing "arc burns" by passing immediately and without rinsing said moving strip of metal, bearing at least some portion of the contents of said plating bath from said bath into contact with a cathodic contact roll outside of said bath which has a contact surface of solid cast iron having a carbon content of about 2 to 6 percent by weight.

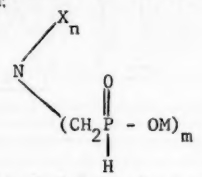
3,870,619
PROCESS FOR PRODUCING BRIGHT ELECTRODEPOSITS OF GOLD AND ITS ALLOYS

Alfred M. Weisberg, Providence, R.I., and Florence P. Butler, Franklin, Tenn., assignors to Technic Inc., Cranston, R.I.

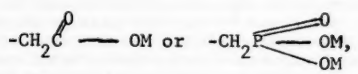
Filed Jan. 29, 1973, Ser. No. 327,681
Int. Cl. C23b *5/28, 5/42*
U.S. Cl. 204—43 G **6 Claims**

1. In an electroplating bath for producing bright gold or gold-base alloy deposits, in a pH range between 3.7 and 6.6, from an aqueous solution containing as the gold source, a water soluble gold cyanide, the improvement comprising, including

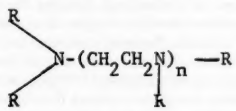
a small but useful amount in the range from about 0.5 gram to 400 grams per liter of a chelating agent selected from the group consisting of those compounds represented by the formula:



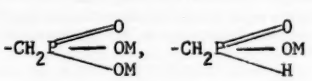
where m, is 1, 2, or 3, n is 0, 1, or 2, $n + m$ is 3; M is H or an alkali metal cation; and X is



and those represented by the formula:



where n is 1, 2, or 3 and R is H,



or $-CH_2COOM$, but at least one R group must be a methylene phosphinic acid and M is hydrogen or an alkali metal cation.

3,870,620
PHOTOPOLYMERIZATION PROCESS FOR THE MANUFACTURE OF COPOLYMER OF BUTADIENE AND ACRYLONITRILE

Akira Onishi; Toshio Yukuta, both of Tokyo; Yutaka Iseda, Kyoto, and Kouichi Iwami, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

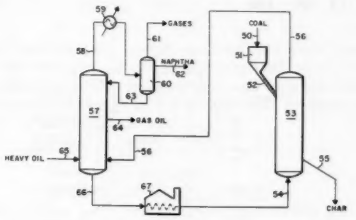
Filed Jan. 21, 1971, Ser. No. 108,563
Claims priority, application Japan, Jan. 23, 1970, 45-5674
Int. Cl. C08d *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.23 **7 Claims**

1. A process for manufacturing butadiene acrylonitrile alternating copolymer in which butadiene and acrylonitrile units are alternately combined so that the mole ratio of the total acrylonitrile units to the total butadiene units is always 1 to 1, as the sole polymerization promoter selected from the group consisting of adding a photosensitizer comprising at least one compound selected from the group consisting of ortho-xylene, meta-xylene, para-xylene, durene, ethylbenzene, chlorobenzene, ortho-dichlorobenzene, bromobenzene, para-dibromobenzene, biphenyl, diphenylmethane and 1,2,3,4-tetrahydronaphthalene to reactants of butadiene and acrylonitrile in the mole ratio of 20/1 to 1/20 and irradiating the mixture with light having a wave length ranging from 2,000 to 6,000 Angstrom units at a temperature of −100° to +100° C.

3,870,621
RESIDUUM PROCESSING

George T. Arnold, Baytown, Tex.; Jack M. Hochman, Cobham, England, and Robert E. Pennington, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 30, 1973, Ser. No. 383,755
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 **10 Claims**



1. A process for the production of low boiling liquid hydrocarbons from coal and a high boiling hydrocarbon oil composed primarily of constituents boiling in excess of about 700° F. which comprises contacting said oil in a contacting zone with a finely divided sub-bituminous or lower rank coal at a temperature in the range between about 700° F. and about 900° F., a pressure in the range between about 10 and about 100 pounds per square inch gauge, and a space velocity between about 0.1 and about 3.0 pounds of oil per hour per pound of coal; withdrawing liquid products overhead from said contacting zone; fractionating said liquid products to obtain a high boiling liquid fraction boiling in excess of about 700° F. and a lighter fraction; recycling said high boiling fraction to said contacting zone; and withdrawing char from said contacting zone.

3,870,622
HYDROGENATION OF A HYDROCRACKED LUBRICATING OIL

William B. Ashton, Nederland; Luis A. Gonzalez, Port Arthur; Gerald V. Nelson, Nederland, and Theodore C. Mead, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 129,231, Sept. 9, 1971, abandoned. This application June 25, 1973, Ser. No. 373,332
Int. Cl. C10g *37/06*
U.S. Cl. 208—93 **10 Claims**

1. A method of treating a hydrocracked lubricating oil stock having an initial boiling point of about 600°F, and having an end point in the range of from about 950°F to about 1,100°F, and containing a substantial portion of mononuclear and dinuclear aromatic compounds, for increasing, the viscosity index thereof, which method comprises:

a. fractionating the hydrocracked lubricating oil stock into a light fraction boiling in the range of about 600°F to about 750°F, and a heavy fraction having an initial boiling point of about 750°F;

b. hydrogenating the light fraction at a temperature of from about 600°F to about 725°F, a pressure of from about 1,000 to about 10,000 psig, a liquid hourly space velocity of from about 0.1 to about 3.0 volumes light fraction per hour per volume of catalyst with from about 500 to about

30,000 standard cubic feet of hydrogen per barrel of light fraction in the presence of a hydrogenation catalyst for saturation of mono-nuclear and di-nuclear aromatics hydrocarbons;

c. reblending the hydrogenated light fraction and the heavy fraction; and

d. separating low boiling cracked hydrocarbon from the reblended lubricating oil of step (c) for adjustment of the initial boiling point to about 600°F.

ALC

3,870,623

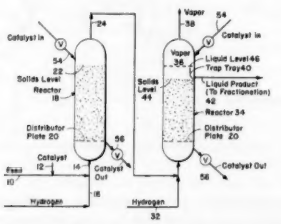
HYDROCONVERSION PROCESS OF RESIDUUM OILS

Axel R. Johnson, North Babylon; Ronald H. Wolk, Trenton, both of N.J., and Seymour B. Alpert, Los Altos, Calif., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Continuation of Ser. No. 210,436, Dec. 21, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 397,071

Int. Cl. C10g *13/02, 9/16;* **B01j** *11/74*

U.S. Cl. 208—108 **2 Claims**



1. In a process for the continuous hydrogenation of a Lagunillas vacuum bottoms having in excess of 500 ppm of metals from the group of vanadium and nickel wherein the residuum and hydrogen are passed upwardly through a reaction zone containing a macroporous microspherical particulate catalyst being closely sized within the range of 60 to 325 U.S. Standard mesh at a rate to place the microspherical catalyst in random motion in the liquid without substantial carryover from the reaction zone and wherein the operating conditions are within a pressure range of 1,000 to 3,000 PSIG, and a temperature range of 750° to 850°F and a liquid space velocity of 0.2 to 2.0 $V_f/hr/V_r$ such as to maintain conversion of at least 80 percent of the portion of the residuum boiling above 975°F to material boiling below 975°F wherein the improvement comprises:

adding said catalyst to and removing said catalyst from the reaction zone at a rate between 0.2 and 0.5 pounds of catalyst per barrel of feed oil such that the percent of vanadium on the spent catalyst is less than 23 percent.

3,870,624

HYDROGENATION CATALYST ACTIVATION

John D. Tice, Wilmington, Del., and Robert I. Benner, Upper Chichester, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 2, 1971, Ser. No. 168,436

Int. Cl. C10g *23/02*

U.S. Cl. 208—143 **5 Claims**

1. A method for reactivating a sulfided Group VI metal hydrogenation catalyst which has become deactivated during use in hydrogenation of hydrocarbons comprising continuing said hydrogenation at an operating pressure of at least about 300 psig, an operating temperature range of at least about 350°F. to at least about 700°F. and a LHSV of at least about 0.2 to at least about 10.0 in the presence of added CS_2 or H_2S, thereby reactivating said catalyst in situ resulting in increased cycle life and decreased temperature required to maintain a fixed conversion level.

3,870,625

PROCESS AND EQUIPMENT FOR THE DE-ASPHALTING OF RESIDUES FROM VACUUM DISTILLATION OF PETROLEUM, AND APPLICATION TO THE REMAINING OF LUBRICANT OIL

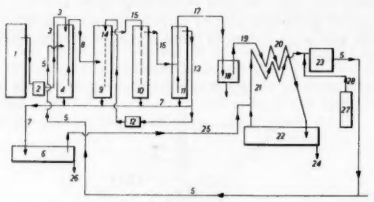
Leck Godfryd Wielezynski, 1 Ave. George V., Paris, France

Filed Oct. 17, 1973, Ser. No. 407,157

Claims priority, application France, Dec. 1, 1972, 72.37293

Int. Cl. C10g *21/14*

U.S. Cl. 208—180 **3 Claims**



1. A method for regeneration of used lubricant oils, comprising spraying used lubricant oil in pulses into the top of a first column, introducing liquid propane into said first column to dissolve a regenerative fraction of the oil therein, removing the thus formed solution of propane and oil fraction from the top of the column along with propane, and undissolved oil in admixture therewith, removing insoluble residue of the oil from the bottom of the column, passing the mixture of oil, propane and oil dissolved in propane successively in a plurality of further columns disposed in series, said mixture being introduced successively into each of said further columns, introducing into one of the further columns, at the top thereof, propane in pulses in counter current flow in said one column with said mixture introduced therein, removing, at the bottom of the further columns, impurities which settle by gravitation in said further columns, removing from the last column a solution of the oil in liquid propane, and separating the oil thus purified from the liquid propane by vaporization of the latter.

3,870,626

METHOD FOR REDUCING THE MERCAPTAN CONTENT OF A MIDDLE DISTILLATE OIL

Robert A. Plundo, Greensburg; Thomas C. Readal, McCandless Township, and James R. Strom, O'Hara Township, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 27, 1973, Ser. No. 336,383

Int. Cl. C10g *23/02*

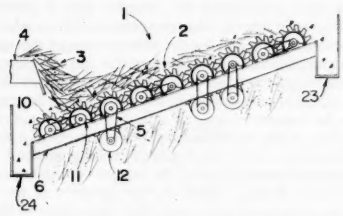
U.S. Cl. 208—216 **12 Claims**

1. A relatively low pressure process for hydrotreating a straight run No. 2 home heating fuel oil feed having a total sulfur content of less than 0.2 weight percent, comprising passing said oil over a hydrotreating catalyst, said straight run feed oil containing more than 30 ppm of mercaptan sulfur, the pressure in said process being no greater than about 150 psi, the temperature in said process being from 400° to below 500°F., hydrogen consumption including solution losses in said process being no greater than about 25 standard cubic feet of hydrogen per barrel of feed oil, and recovering an effluent oil containing less than 30 ppm of mercaptan sulfur, said catalyst having been employed in a prior hydrotreating process operated at a higher pressure than the pressure of the present process until it has been substantially permanently deactivated for purposes of said high pressure process.

3,870,627
MECHANICAL SCREENING DEVICE FOR MACHINE-HARVESTED SUGAR CANE

John W. Herkes, 425 High St., Santurce, P.R. 96793

Filed Nov. 27, 1972, Ser. No. 309,896
Int. Cl. B07b 1/14
U.S. Cl. 209—3 7 Claims



1. In a mechanical screening device comprised of a set of spaced parallel toothed cylindrical horizontal rolls arranged on a slope and power-rotated to pass material deposited thereon up the slope, with the teeth on each roll arranged in spaced rows and the rows of teeth on each roll centered on the space between rows of teeth of the adjacent rolls, the following:

a. each roller tooth has a substantially straight sweptback leading edge of about 52°;

b. the rows of teeth are so located as to provide a lateral space between adjacent teeth of about 6 inches;

c. the roll spacing provides a space of about 12 inches between adjacent rolls;

d. the mechanical screening device also comprises means to drive the rolls at tooth tip speed of at least 350 feet per minute with each roll after the first one to three rolls rotated at a tooth tip speed which is about 15 percent higher than the next preceding roll; and

e. the effective length of the mechanical screening device is at least 21 feet;

whereby as a mat of dirty machine-harvested sugar cane is fed onto the lower end of the mechanical screening device, sugar cane stalks will be disentangled, extraneous material will be loosened from the cane stalks removing large rocks from the mat and all but rocks will progressively pass through the screening device, being spread out in length and thus separated farther because of the progressive increase in speed of the toothed rolls.

3,870,628
PARTS SEPARATOR

Donald B. DeNoyer, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 7, 1973, Ser. No. 422,840
Int. Cl. B07b 13/04
U.S. Cl. 209—90 3 Claims

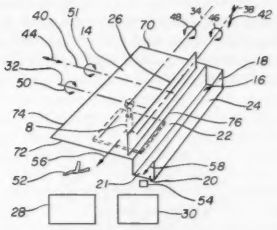
1. Apparatus for separating objects according to size and shape, such as the products and the runners from a plastic molding machine, comprising:

a frame member;

a table having longitudinal and transverse axes, about which it is biaxially adjustably mounted on the frame member and rotatably positioned about both axes to provide the table with a biaxial slant toward a lower end and edge thereof;

a plurality of trough means, each having a bottom wall and a discharge end, arranged in cascading array extending from the table with one trough means positioned adjacent the lower table edge and each succeeding trough means positioned adjacent the bottom wall of the preceding trough means, the bottom walls extending in the same general direction as the table;

gate means positioned in spaced relationship with the lower edge of the table and the bottom wall of each trough means, save the outermost one from the table, whereby each of the objects received on the table are successively separated into one portion passing beneath a gate and

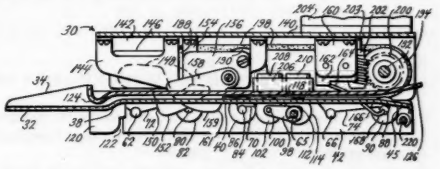


onto the succeeding trough, and another portion passing off the table end, or trough discharge end, all of which portions being collected separately, and each gate means is adjustable normally to, and parallel with, the associated table or trough bottom wall.

3,870,629
PAPER CURRENCY VALIDATOR

Ronald W. Carter, and Charles D. Nash, both of Hot Springs, Ark., assignors to UMC Industries, Inc., New York, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,535
Int. Cl. B07c 5/344; G06k 9/00
U.S. Cl. 209—111.8 28 Claims



1. A validator for documents which comprises a sensor that can respond to relative movement between itself and markings on a document to develop signals, means to provide relative movement between said sensor and said document to enable said sensor to respond to one group of markings on said document to develop a signal and to respond to another group of markings on said document to develop another signal, a sub-circuit which responds to the first said signal to develop an output signal at the end of a predetermined length of time after the termination of said first said signal if further markings are not sensed by said sensor within said predetermined length of time, a second sub-circuit which responds to said other signal to develop a second output signal, means responsive to the development of the first said output signal to enable utilization of said second output signal if the first said output signal is developed by the first said sub-circuit before said second output signal is developed by said second sub-circuit.

3,870,630
SCREEN TENSIONING DEVICE

Raymond S. Tylinski, Milwaukee, Wis., assignor to Rock Industries Machinery Corporation, Milwaukee, Wis.

Filed Aug. 15, 1973, Ser. No. 388,365
Int. Cl. B07b 1/48
U.S. Cl. 209—403 4 Claims

1. A vibrating screen tensioning device for securing the upturned edges of a screen to the opposite sidewalls of a material vibrator, said device comprising:

side rails positioned in a parallel spaced relation along the inside surface of the sidewalls, each side rail including,

a central web,

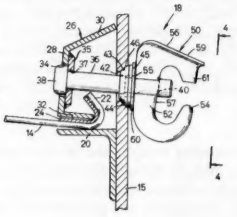
a pivot flange along the upper edge of the central web,

and a screen locking flange along the lower edge of the central web,

a plurality of openings spaced along the central web in positions corresponding to openings in the sidewalls,

a tensioning shaft extending through each pair of corresponding openings in said web and in said sidewall,

a slot in said tensioning shaft having one edge spaced outwardly from said sidewall,



a C-shaped wedge for each shaft, each wedge including a tapered center section, a tapered arcuate section at one end of said center section, and an acute angled flat section at the other end of said center section, a centering washer on each of said shafts between said sidewall and said center section of said wedge when said screen is in tension, one of said wedges being positioned in each of said slots with one edge of said center section bearing on the said washer and the other edge bearing on one end of said slot.

3,870,631

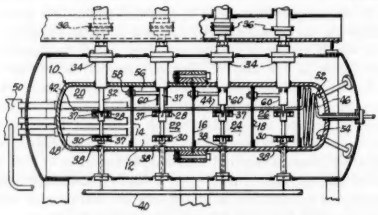
APPARATUS AND METHOD FOR WET OXIDATION OF ORGANIC MATTER

W. Martin Fassell, Newport Beach, and Donald W. Bridges, Irvine, both of Calif., assignors to Barber-Colman Company, Rockford, Ill.

Continuation-in-part of Ser. No. 346,152, March 29, 1973,. This application Sept. 24, 1973, Ser. No. 400,123

Int. Cl. C02b *3/08*; **C02c** *5/04*

U.S. Cl. 210—63 **7 Claims**



1. In a process for oxidation of combustible organic matter in an aqueous system in the form of solution or dispersion by exposure to an oxygen containing gas under elevated pressure and temperature conditions, for a time sufficient to effect substantial reduction in chemical oxygen demand, the improvement which comprises vigorously agitating the aqueous system and simultaneously introducing the oxygen containing gas into the area adjacent high agitation to effect immediate breakdown of the oxygen containing gas into fine increments which are rapidly distributed throughout the aqueous system and to effect rapid transport of free radicals generated by the oxidation reaction to other sites capable of oxidation of combustible organic matter before expiration of the life of the free radicals, thereby to catalyze the oxidation reaction to achieve a high rate of oxidation of combustible organic matter in the aqueous medium.

7. In a reactor for the wet oxidation of combustible organic matter in an aqueous dispersion or solution, an elongate horizontally disposed continuous chamber having an inlet at one end portion and an outlet at the other end portion, vertically disposed walls subdividing the chamber into a plurality of compartments in side by side arrangement with an inlet in the compartment at one end for the introduction of the aqueous solution and dispersion of organic matter and an outlet in the compartment at the other end for the removal of aqueous liquor which has been subjected to wet oxidation during travel through the compartments, an agitator in the compartments for agitation of the aqueous solution or dispersion within the compartment, a source of oxygen containing gas, and means for continuous introduction of the oxygen containing gas into compartments in the vicinity of high agitation of the liquid within the compartment for immediate dispersion of the oxygen containing gas as fine increments in the liquid and for rapid transport of free radicals generated upon combustion to other combustion sites before expiration of the free radicals to catalyze the oxidation reaction, and a passage through the separating walls for communicating the adjacent compartments for flow of fluid from one compartment to the other through the chamber.

3,870,632

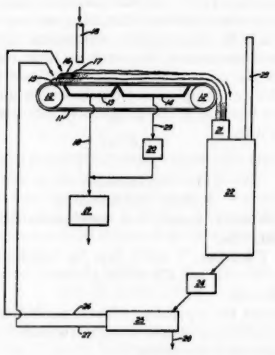
TRAVELING FILTER FOR USE WITH FILTER MEDIUM INCINERATION PROCESS

Donald Baldwin Erskine, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1970, Ser. No. 76,788

Int. Cl. B01d *37/00*

U.S. Cl. 210—67 **4 Claims**

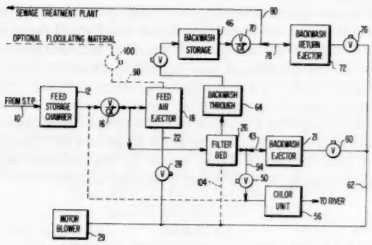


1. Method of treating sewage comprising placing an unoxidizable filter medium on a movable permeable support, depositing sewage on said filter medium, collecting substantially liquid effluent therefrom, withdrawing said support and depositing fouled filter medium in a furnace, incinerating the filter medium and sewage solids therein, recovering the filter medium, and replacing the filter medium on the moving support.

3,870,633
SELF-CONTAINED TERTIARY FILTER PLANT AND CHLORINATION UNIT

William R. Setterstrom, 99 Winfield Rd., Saint Albans, W. Va. 25177

Filed Nov. 15, 1973, Ser. No. 416,218
Int. Cl. B01d *23/16*
U.S. Cl. 210—136 **6 Claims**



1. A self-contained tertiary filter plant and chlorination unit for treatment of effluent from an aerobic sewage treatment plant, said tertiary filter plant comprising a retangular unit container including imperforate top, bottom, side and end walls and provided with a pair of laterally spaced internal vertical bulkheads defining a center vertical dry well section and outer vertical liquid chamber sections to each side thereof, horizontal and vertical partitions within at least one outer section defining upper and lower feed storage and feed air ejector chambers side by side with an upper filter chamber and a lower backwash ejector chamber on one side of the center dry well section, said other outer section having means forming at least a chlorinator chamber, said filter plant and chlorination unit further including:

closable inlet means for fluid coupling the upper feed storage chamber to an upstream sewage treatment plant for receiving liquid effluent therefrom;

first pipe means fluid coupling the feed storage chamber to the underlying feed air ejector chamber;

said filter bed chamber including a filter bed positioned at a vertical height above that of said feed air ejector chamber;

a feed trough overlying said filter bed and adapted to permit effluent to overflow onto said filter bed for filtration thereof;

said chlorinator chamber including chlorine treatment means;

a discharge outlet from said chlorination chamber;

second pipe means for gathering filtered effluent from the bottom of said filter bed and rising to a level above said filter bed and extending across said center section of said unit and terminating with its discharge end opening up into said chlorination chamber for normally discharging said filtered effluent into said chlorination chamber;

a source of pressurized air;

said first pipe means having an upper end overlying said feed trough, first air ejector means carried by said first pipe means;

a check valve within said first pipe means opening up into said feed storage chamber to prevent liquid effluent from entering said pipe from said feed storage chamber but not vice-versa, said air ejector means comprising an air injection pipe fluid coupled to said air source extending within said fluid pipe means and discharging into the feed air ejector chamber for forcing effluent stored therein to flow up through the first pipe means for discharge into said feed trough;

third pipe means fluid coupling said second pipe means at a level about said filter bed directly to said lower backwash ejector chamber underlying said upper filter chamber;

whereby, filtered liquid is maintained within said lower backwash ejector chamber to the full height of the same, and within said second pipe means and said third pipe means to a level above that of said filter bed and unfiltered liquid to a level above that of said filter bed within said filter chamber;

a backwash removal trough extending horizontally across said filter chamber at a height below the feed trough and above said second pipe means and having its discharge end extending through the vertical bulkhead separating said central section from said one outer section;

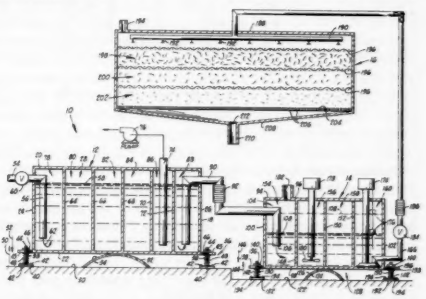
said second pipe means including selectively closable valve means for shutting off flow of filtered liquid through said second pipe means to said chlorinator chamber; and

said filter plant and chlorinator unit further comprises means responsive to loss of filtering capability of said filter unit to close said selectively operated valve means within said second pipe means and to terminate effluent flow into said feed storage chamber and to force liquid stored within said backwash ejector chamber to reverse flow through said third pipe means, and said second pipe means, to backwash the filter and to be removed from said filter chamber automatically when the liquid level within the filter bed chamber rises to the level of the backwash removal trough.

3,870,634
MARINE SEWAGE TREATMENT SYSTEM FOR WATER CRAFT

Frank Humphrey, P. O. Box 74966, Oklahoma City, Okla. 73107

Continuation-in-part of Ser. No. 258,719, June 1, 1972, abandoned. This application May 8, 1974, Ser. No. 467,932
Int. Cl. B01d *23/02, 21/10*
U.S. Cl. 210—220 **11 Claims**



1. A marine sewage treatment system for installation on a marine vessel, comprising:

a first tank having a top, a bottom and a chamber for retaining a predetermined amount of fluid;

an inlet pipe having a portion extending through the first tank disposing one end thereof in the first tank chamber for discharging sewage effluent into the first tank chamber;

an outlet pipe having a portion extending through the first tank disposing one end thereof in the first tank chamber receiving fluid discharging from the first tank chamber;

a baffle disposed within the first tank chamber between the portions of the inlet pipe and the outlet pipe disposed in the first tank chamber, the baffle connected to the first tank and having baffle openings formed therethrough providing a passageway for the fluid discharged via the inlet pipe and moving through the first tank chamber toward the outlet pipe;

a base;

an anchor connected to the base and having a tank supporting surface engaging a portion of the first tank bottom

supporting the first tank a distance above the base, the first tank being pivotable about the anchor agitating the fluid within the first tank chamber;

guides, each guide connected to the base and having a portion connected to the first tank bottom and cooperatingly positioning the first tank relative to the anchor during the pivotal movement of the first tank about the anchor; and

means having a portion biasingly engaging the first tank bottom biasing the first tank toward a level position on the anchor, the first tank being pivotally movable about the anchor generally against the biasing force.

3,870,635

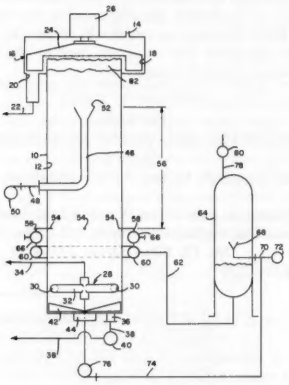
APPARATUS FOR CLARIFYING AN INFLUENT WATER

Ian J. H. Clarke-Pounder, Pennington, N.J., assignor to Improved Machinery Inc., Nashua, N.H.

Continuation of Ser. No. 314,797, Dec. 13, 1972, abandoned. This application June 24, 1974, Ser. No. 482,076

Int. Cl. B03d *1/00*

U.S. Cl. 210—221 **2 Claims**



1. Apparatus for clarifying an influent water, comprising a vessel containing a generally vertically elongated, totally enclosed, clarifying chamber, influent water supply means operatively associated with said clarifying chamber for supplying influent water into said clarifying chamber, said influent water supply means comprising influent water supply conduit means extending upwardly in said clarifying chamber and diffuser means in said clarifying chamber at a location substantially spaced above the lower end of said clarifying chamber, a second vessel, means operatively associated with said second vessel for supplying gas thereto for intermixture with carrier liquid therein, bubble-producing-and-discharge means for producing gaseous bubbles and discharging such bubbles intermixed with carrier liquid into said clarifying chamber, said bubble-producing-and-discharge means being operatively associated with said clarifying chamber for producing the gaseous bubbles immediately adjacent the discharge thereof into said clarifying chamber, said bubble-producing-and-discharge means comprising a plurality of discharge nozzles spaced around said clarifying chamber adjacent the periphery thereof and arranged for discharging the gaseous bubbles into said clarifying chamber in a direction at least generally transversely thereof, said discharge nozzles being substantially spaced longitudinally of said clarifying chamber below said diffuser means and also spaced longitudinally of said clarifying chamber above the lower end thereof, said discharge nozzles being more adjacent to the lower end of said clarifying chamber than to the upper end thereof, means communicating said discharge nozzles with said second vessel for supplying gas intermixed with carrier liquid from said second vessel to said discharge nozzles, said communicating means comprising a header extending around said vessel and conduits connecting said discharge nozzles to said header, valve means operatively associated with said conduits for controlling fluid flow therethrough, solid material discharge means operatively associated with said clarifying chamber for discharging solid material from adjacent the upper end thereof, liquid discharge means operatively associated with said clarifying chamber for discharging liquid from adjacent the lower end thereof, and conduit means communicating said clarifying chamber with said second vessel for supplying liquid discharged from said clarifying chamber to said second vessel for intermixture with gas therein, the portion of said clarifying chamber between said diffuser means and said discharge nozzles being free of transversely extending separating media to permit the supplied gaseous bubbles to readily rise in said clarifying chamber and cause upward movement of solid material contained in a supplied influent water while liquid in the influent water passes downwardly to said liquid discharge means.

3,870,636

STRAIGHT-THROUGH FILTER APPARATUS

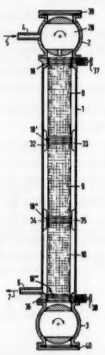
Kurt Schettler, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Oct. 31, 1972, Ser. No. 302,581

Claims priority, application Germany, Nov. 2, 1971, 2154363

Int. Cl. B01d *27/08*

U.S. Cl. 210—236 **9 Claims**



1. A straight-through filter apparatus for contaminated liquid comprising a tubular body forming housing, a plurality of serially connected filter media disposed in said tubular housing; connecting means disposed between said filter media and serially connecting said filter media one to the other; said filter media and said tubular housing defining therebetween an annular passageway for receiving therein clean liquid filterable through said filter media; valve means located respectively at each end of said tubular housing; contaminated liquid inlet means commucating with one of said valve means, and clean liquid outlet means communicating with said annular passageway, said one valve means being constructed and arranged so that in a first position it transmits contaminated liquid introducible through said inlet means to said filter media for filtering contaminants therefrom, the clean liquid passing into said annular passageway and being dischargeable from said annular passageway through said outlet means; said valve means at each end of said tubular housing being formed with a respective valve opening having a cross section corresponding to the cross sectional area of said filter media and

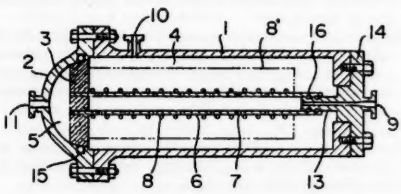
including a respective housing cover located on each of said valve means, the other valve means being constructed and arranged so that in a first position it blocks fluid flow from said tubular housing to its respective cover, the apparatus further comprising respective tubular containers interchangeable with said housing covers for removing the filter media from said tubular housing and replacing them with other filter media, said valve means being shiftable to a second position wherein said respective valve openings are aligned with said tubular housing and means for urging fresh filter media from one of said tubular containers through one of said valve openings into said tubular housing and simultaneously urging spent filter media in said tubular housing through the other of said valve openings into the other of said tubular containers.

3,870,637

APPARATUS FOR SEPARATING FLUIDS

Isao Miyoshi; Sadao Sanjo; Toshisuke Takenaka; Shoji Mizutani; Isao Hamana, and Seiichi Hayashi, all of 2-1, Hinode-machi, Iwakuni-shi, Japan

Filed Apr. 3, 1973, Ser. No. 347,471
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—243 **10 Claims**



1. In a fluid separatory apparatus in which a shell having an inlet and an outlet, and a cover having an outlet are joined in a tight seal and form a vessel, a filter is stored in the shell-side zone, and the vessel is partitioned into two chambers of fluid separation and fluids treatment with a cast flange forming one end of the filter, for separating a specified component from a fluid mixture utilizing their different permeation rates through a permeable membrane wall, the improvements characterized in that the filter comprises the cast flange, a hollow porous core in about the centers of the fluids treatment chamber and said flange and a multiplicity of permeable, hollow filaments spirally wound around the core, said flange being of a truncated cone and tapered toward said cover with the tapered portions of said flange cooperating with the corresponding tapered portions of said cover in fluid-tight relation thereto; one end of said core in the cover-side zone is closed and the other end is opened; both ends of hollow filaments spirally wound around said core are imbedded and secured in said flange and have their open ends in the fluid separatory chamber; said permeable hollow filaments being spirally wound around said core by starting the winding in the flange-side zone and after winding a given fiber length reversing in the direction of the flange, such windings being repeated to form a bundle of the filaments, so that each filament satisfies the following conditions:

1. $0.20 \quad D \quad 0.67$
2. $0 < T \quad -20(D-1)$
3. $0 < L \quad -22.7 \times 10^{-4}\,(\eta Q/NR^4) + 650$

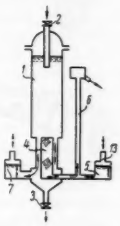
wherein D is the ratio of the actual volume of the hollow filaments to an apparent volume of the bundle of hollow filaments, T is a thickness of said bundle, L is a filament length in centimeters from one end to the other end of each hollow filament forming the bundle, N is the number of filament end openings in the surface of the flange in the fluid separatory chamber, η is a viscosity coefficient in poises flowing in the interior of the hollow filaments and Q is the rate of flow in cc/sec of fluids flowing through the interior of the N hollow filaments, and having in the opening of said core a protuberance of the shell so that said core is longitudinally slidably held in position.

3,870,638

PULSATING FILTER-THICKENER

Susanna Mikhailovna Karpacheva, 2 Schukinsky Prozed, 2, kv. 88; Jury Georgievich Karkhachev, Astakovsky Pereulok 1/2, kv. 118; Valeryan Matveevich Muratov, 7 ulitsa Oktyabrskogo Polya, 5, kv. 6, and Leonid Solomonovich Raginsky, Nikitinskya ulitsa, 16, kv. 29, all of Moscow, U.S.S.R.

Continuation of Ser. No. 819,321, April 25, 1969, abandoned. This application May 27, 1971, Ser. No. 147,636
Claims priority, application U.S.S.R., May 6, 1968, 1238756
Int. Cl. B01d *29/38*
U.S. Cl. 210—333 **8 Claims**



1. A pulsating filter-thickener for continuous clarification of solutions, said thickener comprising a vessel; means for filling the vessel with a slurry to be clarified; at least one filter element having an inner cavity, said filter element being disposed in said vessel and immersed during filtration in the slurry; a first pulsator chamber connected to said inner cavity of said filter element to produce alternate high and low pressure pulses in said cavity and cause filtrate to enter the cavity and the first pulsator chamber during the low pressure pulses and flow back to the filter element during the high pressure pulses; a pipe connected to the first pulsator chamber for the discharge of filtrate therefrom during the high pressure pulses whereby a portion of the filtrate is withdrawn from the thickener during the high pressure pulses while another portion flows back through the filter element; a second pulsator chamber connected to said vessel to produce periodic pressure pulses to cause the slurry to flow in a pulsating, reciprocating fluid stream at the outside of the filter element and dislodge solid particles caked on the outside of the filter element; and means for discharging thickened slurry from said vessel.

3,870,639

FILTERING DEVICE

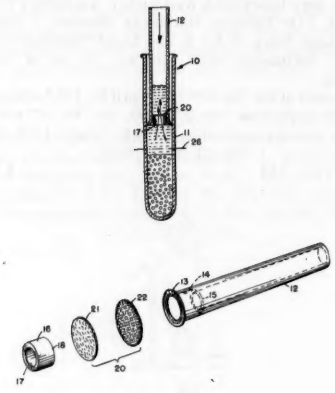
Francis C. Moore, and Leon R. Perkinson, both of Indianpolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.

Filed Jan. 2, 1974, Ser. No. 429,594
Int. Cl. B01d *33/00*
U.S. Cl. 210—359 **17 Claims**

1. A device for filtering liquids to separate and confine the particulates contained therein, comprising an outer tube closed at the lower end thereof and adapted to contain the liquid to be filtered, an open-ended inner tube, and flexible lip means projecting outwardly at the lower end of said inner tube for slidably and sealingly engaging the inside surface of said outer tube, wherein the improvement comprises

a filter retaining sleeve having an outer surface with a diameter slightly smaller than the inside diameter of said inner tube at the lower end thereof and having a relatively large flow passage extending axially therethrough, said retaining sleeve being disposed within the lower end of said inner tube, and a thin flexible membrane filter of gener-

ally circular configuration having planar dimensions substantially larger than the inside diameter of said inner tube, said filter membrane having a central portion extending over one end of said sleeve and have a peripheral skirt portion tightly interfitted between the outer surface



of said sleeve and the inside surface of the inner tube at the lower end thereof, said filter membrane thereby being supported to filter liquid flowing through the flow passage of said sleeve and providing a sealing gasket for securing the sleeve and membrane in place within the inner tube.

3,870,640

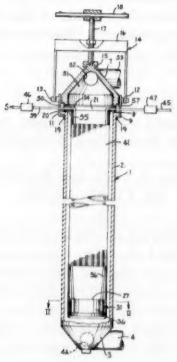
FILTER WITH VIBRATION OF SCREEN

Thomas L. Reece, Texas Twp., Kalamazoo County, Mich., assignor to Dover Corporation, Kalamazoo, Mich.

Division of Ser. No. 212,461, Dec. 27, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,786

Int. Cl. B01d *33/00*

U.S. Cl. 210—388 **6 Claims**



1. In a filter apparatus for inhibiting the accumulation of solid material on or across the openings of a filter element and including a liquid line having vertically spaced first and second liquid conduits, a casing having a first end outlet closure member and a second end closure member each of which is provided with an aperture and means for respectively connecting the first and second end closure members to the first and second liquid conduits through said apertures in sealing relationship therewith whereby the casing closure members provide a closed liquid connection for carrying liquid between said conduits, the filter element being pendently disposed within the casing and having an upper end portion supported by the casing and in communication with the first conduit leaving a liquid chamber within the casing surrounding and extending below and beyond the lower free end portion of the filter element, the improvement comprising:

a vibrator directly fixed to and supported by the lower end portion of said filter element, said vibrator being spaced within said casing and from the upper end of the filter element;

means defining a pair of vibrator energizing passageways, said passageways including a pair of conduits in the casing and having ends essentially fixed with respect to the corresponding ends of said filter element, said conduits having lower ends connected to said vibrator and extending longitudinally of the filter element to source ends at the upper end of said filter element, said passageways further including conduits external of said casing for respective connection with external supply and return energy means; and

flange means pendently supporting said filter element and releasably holding the upper end of said filter element onto said casing, said flange means incorporating intermediate portions of said passageways which interconnect said conduits in the casing to said conduits external of said casing;

said flange means, filter element, passageway means and vibrator defining a single integral unit for insertion into and removal from said casing.

3,870,641

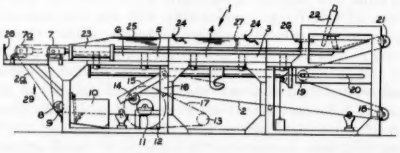
HORIZONTAL BELT FILTERS

Henri Gerhard Willem Pierson, Greenwood Bozeat, Wellingborough, England

Filed Sept. 24, 1973, Ser. No. 399,997

Int. Cl. B01d *33/04*

U.S. Cl. 210—400 **1 Claim**



1. A horizontal belt filter, comprising as a filtering medium, an endless belt of filter cloth arranged to have an upper horizontal reach, vacuum trays disposed beneath said upper horizontal reach, and means for feeding material to be filtered onto said upper horizontal reach, means for intermittently advancing the belt by a predetermined distance comprising a movable roller and rams which are extensible to move the roller outwardly, wherein the belt is driven through a roller which has a ratchet device to prevent pulling back of the belt on movement of the movable roller and including a tensioning roller which takes up a slack in the belt which is pulled out on movement of the movable roller.

3,870,642

GREASE THICKENED WITH OXYGEN-LINKED POLYUREAS

Eberhard Gegner, Hamburg, Germany, assignor to The British Petroleum Company Limited, London, England

Filed Nov. 29, 1973, Ser. No. 420,004

Claims priority, application Germany, Dec. 11, 1972, 2260496

Int. Cl. C10m *5/20, 7/32, 7/30*

U.S. Cl. 252—51.5 A **31 Claims**

18. A grease composition comprising a lubricating oil thickened by 3–30% by weight of a polyurea formed in situ, said composition being formed by a process which comprises reacting a monoamino component and a diamino component with a di-isocyanate component in a lubricating oil at a temperature in the range 20°C to 150°C wherein

a. the monoamino component comprises a mixture of at least two members selected from the following general formulae:

$$R^1—NH_2$$
$$R^2—NH_2 \text{ and}$$
$$R^3—O—R^4—NH_2$$

in which R^1 is a monovalent aliphatic radical containing 12 to 24 carbon atoms, R^2 is a monovalent aromatic radical, R^3 is a monovalent aliphatic radical containing 2 to 10 carbon atoms and R^4 is a divalent aliphatic radical containing 2 to 4 carbon atoms,

b. the diamino component comprises a dioxa-alkane diamine or a mixture of dioxa-alkanediamines of the general formula: $NH_2—R^5—O—R^6—O—R^7—NH_2$

in which R^5 and R^7 are divalent aliphatic radicals containing 2 to 4 carbon atoms and R^6 is a divalent aliphatic radical containing 2 to 10 carbon atoms, and

c. the di-isocyanate component comprises an aromatic di-isocyanate or a mixture of aromatic di-isocyanates wherein the molar ratio of the monoamino, diamino and di-isocyanate components is in the range of 2:1:2 to 2:2:3.75.

3,870,643

PETROLEUM HYDROCARBON COMPOSITIONS

Paul M. Kerschner, Trenton, and Alphonso W. Marcellis, Boonton, both of N.J., assignors to Cities Service Oil Company, Cranbury, N.J.

Division of Ser. No. 139,142, April 30, 1971,. This application Feb. 1, 1973, Ser. No. 328,572

Int. Cl. C10m *1/26*

U.S. Cl. 252—56 R **4 Claims**

1. A petroleum hydrocarbon composition comprising a petroleum hydrocarbon and from between about 1 to 20 percent by volume of a condensation product of a polyether-polyester polyol having 2 to about 12 hydroxyl groups and a monocarboxylic acid wherein at least about 85 percent of the hydroxyl groups of said polyol are converted to ester groups by condensation of said monocarboxylic acid containing about 12–24 carbon atoms

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3,870,644

LIQUID DEVELOPER FOR PLURAL-COLOR ELECTROPHOTOGRAPHY

Hazime Machida, and Zenjiro Okuno, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 9,971, Feb. 9, 1970, abandoned. This application Nov. 20, 1972, Ser. No. 307,993

Claims priority, application Japan, Feb. 10, 1969, 44-9277

Int. Cl. G03g *9/00*

U.S. Cl. 252—62.1 **5 Claims**

1. In a set of liquid developers for plural-color electrophotography, in which each developer comprises a toner dispersed in a carrier liquid, said carrier liquid being a liquid hydrocarbon having an electric resistance of at least $10^9\Omega$.cm and a dielectric constant of not greater than 3, said set of liquid developers comprising separate liquid developers respectively containing as the only toner present therein

a. a magenta-color toner consisting essentially of finely divided particles of photoconductive substance colored with a magenta-coloring agent;

b. a cyan-color toner consisting essentially of finely divided particles of photoconductive substance colored with a cyan-coloring agent;

c. a black-color toner consisting essentially of finely divided particles of photoconductive substances colored with a black-coloring agent;

d. a yellow-color toner consisting essentially of finely divided particles of photoconductive substance colored with a yellow-coloring agent, the improvement which comprises: the photoconductive substance in each of said toners is a colorless, transparent photoconductive substance selected from the group consisting of anthracene, imidazole, carbazole, poly-3,6-dibromovinylcarbazole, poly-2,3-dichlorovinylcarbazole, poly-2,4-dichlorovinylcarbazole, poly-3,6-dichlorovinylcarbazole, poly-3-bromo-6-chlorovinylcarbazole, poly-3-bromovinylcarbazole, poly-3-chlorovinylcarbazole, poly-N-vinylcarbazole, polyvinyllanthracene, polyvinylcarbazole, polydimethylaminostyrene, polyorthobromocarbazole, poly-2,3-dichlorovinylanthracene, polyorthochlorovinylcarbazole, poly-2,4-dichlorocarbazole, and poly-2-chlorovinylanthracene.

3,870,645

FERROMAGNETIC COMPOSITIONS OF MATTER

Ephraim H. Frei; Shmuel Yerushalmi, and Yusuf Benmair, all of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovoth, Israel

Continuation-in-part of Ser. No. 94,380, Dec. 2, 1970, abandoned.

Filed May 8, 1973, Ser. No. 358,404

Claims priority, application Great Britain, Dec. 3, 1969, 58966/69

Int. Cl. C04b *35/26*

U.S. Cl. 252—62.56 **6 Claims**

1. A ferromagnetic composition of matter for diagnostic purposes, consisting essentially of a magnetic physiologically acceptable ferrite, from the group consisting of magnesium ferrite, barium ferrite, manganese ferrite, manganese-zinc ferrite, magnesium-zinc ferrite, and nickel ferrite, and having incorporated therewith, at least one member from the group consisting of sorbitol and citric acid.

3,870,646

SUBSTITUTED AMIDES

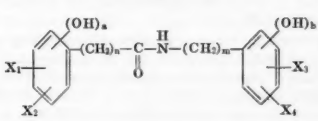
Edward S. Blake, Dayton, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 92,898, Nov. 25, 1970, Pat. No. 3,706,796. This application Dec. 15, 1972, Ser. No. 315,381

Int. Cl. C11d *9/50*

U.S. Cl. 252—107 **10 Claims**

1. An antiseptic detergent composition comprising a detergent soap and 0.1 to 10 percent by weight based on the detergent soap of a compound of the formula



wherein,

n and m independently are 0 or 1 provided that the sum of $n + m$ is at least 1;

a and b independently are 0 or 1 provided that the sum of $a + b$ is at least 1: and provided that when n is 0 a is 0; and X_1, X_2, X_3 and X_4 are independently selected from the halogens chlorine and bromine.

3,870,647
LIQUID CLEANING AGENT

Hal Travers, Snyder, N.Y., assignor to Seneca Chemicals, Inc., Buffalo, N.Y.

Filed June 5, 1972, Ser. No. 259,548
Int. Cl. C11d *9/02, 9/30*
U.S. Cl. 252—118 **7 Claims**

1. A biodegradable liquid laundry detergent composition consisting essentially of:

a. from about 1.2 to 75 volume percent of a hydrophillic solvent consisting essentially of propylene glycol,
b. from 5.6 to 33 volume percent of tall oil acids,
c. from 1.0 to 6.5 volume percent of an alkanolamine of from about 2 to 7 carbon atoms sufficient to provide a pH in the range above 7 and below about 10 in the resulting liquid laundry detergent composition, and
d. from 0.5 to 60 volume percent of at least one ethoxylate of an alcohol of from 12 to 15 carbon atoms produced by the reaction of from 3 to 9 moles of ethylene oxide per mole of alcohol, said amounts based on the non-aqueous components of said composition.

3,870,648
POLYELECTROLYTES AS DETERGENT BUILDERS

Richard Anthony Grifo, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 14, 1971, Ser. No. 106,549
Int. Cl. C11d *3/04, 11/00*
U.S. Cl. 252—135 **2 Claims**

1. A process for producing an ecologically desirable detergent composition suitable for washing textiles, comprising admixing, as essential ingredients, a detergent selected from the group consisting of nonionic, anionic, cationic and amphoteric detergents, together with a composite builder, as sole builder, consisting of a member selected from the group consisting of polyvinyl methyl ether/maleic anhydride, salts and hydrolysis products thereof having a K value of from 10 to about 200 and at least one alkali metal salt selected from the group consisting of alkali metal carbonates, alkali metal silicates, and alkali metal borates wherein the ratio of polyvinyl methyl ether/maleic anhydride group member to alkali metal salt group member is, in parts by weight, from 1:100 to 1:2, the ratio of the detergent to the composite builder being, in parts by weight, 8:1 to 1:100, whereby to produce an ecologically desirable detergent composition at least substantially devoid of non-polluting nitrogen and phosphorus.

3,870,649
PROCESS FOR COMMINUTING FLUORESCENT WHITENING AGENTS AND COMPOSITIONS OBTAINED THEREBY

Theodore A. Langstroth, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 201,198, Nov. 22, 1971, Pat. No. 3,781,215, which is a continuation-in-part of Ser. No. 839,703, July 7, 1969, abandoned. This application June 1, 1973, Ser. No. 366,069The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. D06l *3/12*
U.S. Cl. 252—301.3 W **8 Claims**

1. A process for treating a presscake consisting essentially of water and relatively large crystals of a fluorescent whitening agent selected from the group consisting of disodium 4,4′-bis-(4,6-dianilino-s-triazin-2-ylamino)-2,2′-stilbenedisulfonate, disodium 4,4′-bis(4-anilino-6-morpholino-s-triazin-2-ylamino)-2,2′-stilbenedisulfonate, disodium 4,4′-bis(4-anilino-6-[2,2′-dihydroxyethylamino]-s-triazin-2-ylamino)-2,2′-stilbenedisulfonate, disodium 4,4′-bis(4-anilino-6-[2-hydroxyethylamino]-s-triazin-2-ylamino)-2,2′-stilbenedisulfonate and sodium 2-(4-stilbyl)-naphtho-[1′, 2′:4,5]-1,2,3-triazole-2-sulfonate, which comprises grinding said presscake at a temperature of 20° to 60°C in the presence of at least one and up to eight molecular equivalents of anhydrous sodium sulfate for each ten molecular equivalents of water in said presscake until the crystals are reduced to an average particle size of approximately 5 microns with substantially none of the crystals greater than 15 microns in the largest dimension.

3,870,650
EUROPIUM-ACTIVATED RARE EARTH OXIDE PHOSPHORS

John L. Ferri, Towanda, and James E. Mathers, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 155,330, June 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 812,825, April 2, 1969, abandoned. This application Sept. 13, 1973, Ser. No. 397,013
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4 R **7 Claims**

1. A particulate cathodoluminescent phosphor having the empirical formula, $(Y_{1-x}Gd_x)_2O_3$:Eu, wherein x is from 0 to 1, the molar ratio of europium to yttrium and gadolinium being from about 0.1:100 to about 20:100, having at least 70 percent of parallelepipedonal particles and an overall average size of from about 1 to about 20 microns.

3,870,651
CARBONATED ORGANIC SOLVENT

David D. Pipkins, Downers Grove, Ill., assignor to The Valspar Corporation, Minneapolis, Minn.

Division of Ser. No. 154,411, June 18, 1971, Pat. No. 3,747,523, which is a continuation-in-part of Ser. No. 80,833, Oct. 15, 1970, Pat. No. 3,705,044. This application Apr. 18, 1973, Ser. No. 352,215
Int. Cl. B01f *3/04;* **C09d** *11/00*
U.S. Cl. 252—364 **2 Claims**

1. A carbonated solvent for paints and inks comprising: an aromatic hydrocarbon solvent selected from the group consisting of toluol and xylol; and gaseous carbon dioxide interstitially spaced in the solvent in an amount in excess of one volume of gaseous carbon dioxide per volume of solvent and up to four volumes per volume.

3,870,652
PRODUCTION OF ACTIVATED CHAR USING A MOVING GRATE STOKER FURNACE

Charles M. Whitten, Rt. 7, Golf Course Ln., Columbia, Tenn. 38401, and Robert G. Hagstrom, 2401 Sterling Rd., Nashville, Tenn. 37215

Continuation-in-part of Ser. No. 130,737, April 12, 1971, abandoned, and a continuation-in-part of Ser. No. 35,771, April 13, 1973, Pat. No. 3,642,170. This application Aug. 13, 1973, Ser. No. 387,753
Int. Cl. C10b *49/06*
U.S. Cl. 252—421 **5 Claims**

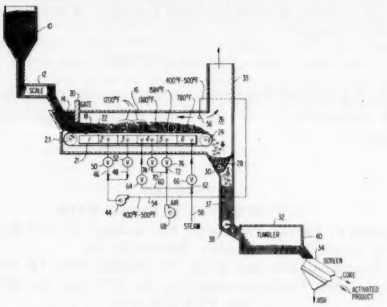
1. The method of making activated carbon from a carbonaceous starting material selected from the class consisting of wood, peat, brown coal, lignite, subbituminous coal, bituminous coal, semi-anthracite coal and antracite coal, which method comprises,

continuously depositing said starting material onto a continuously moving grate running horizontally from front to rear through a hot carbonizing furnace and, in so doing, passes over a series of first, second and third airbox zone means consecutively arranged from front to rear of the furnace,

downdrafting hot gases through the bed from above that portion of the bed which is disposed towards the rear of the furnace from the first airbox zone means as the bed moves over first airbox zone means so as to drive off moistuure and volatile matter from and pre-heat the material,

simultaneously feeding air upwardly through the bed as the latter passes over the second airbox zone means and thereby raising the bed temperature from the pre-heat temperature to a charring temperature,

simultaneously feeding steam upwardly through the bed as the latter passes over third airbox zone means so as to reduce the bed temperature, and



simultaneously feeding the downdrafted gases ladened with moisture and volatile matter into the rear portion of the furnace over that portion of the bed which is then passing over the third airbox zone means and thereby maintaining a reducing atmosphere in the furnace over the bed.

3,870,653

MODIFIED HALOGENATED ALUMINA CATALYST FOR ISOMERIZING SATURATED HYDROCARBONS

Bernard Torck, Boulogne-sur-Seine; Michel Derrien, Rueil-Malmaison, and Jean-Pierre Franck, Bougival, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Oct. 25, 1972, Ser. No. 300,587

Claims priority, application France, Oct. 29, 1971, 71.39151

Int. Cl. C07c *5/28*

U.S. Cl. 252—429 R **15 Claims**

1. In a process for manufacturing a catalyst, wherein alumina composited with a platinum group metal is halogenated with a halogen compound selected from the group consisting of chlorinated hydrocarbon, chlorine, $SOCl_2$, SO_2Cl_2 and S_2Cl_2, to form a composite consisting essentially of alumina, about 1–20 percent by weight of halogen, and about 0.01–5 percent by weight of said platinum group metal, the improvement of also compositing with said alumina an aromatic compound of the formula $(R)_m$ Ar $(Z)_x$ where x is an integer of at least 2, m is zero or an integer, (x + m) being at most the maximum valence of Ar, Ar is an aromatic hydrocarbon radical containing at least one carbocyclic ring, the m groups R are independently halogen atoms or monovalent hydrocarbon radicals and the x groups Z are independently hydroxy, oxo or hydrocarbyloxy, the aromatic compound content of said composite being about 0.001–20 percent by weight.

3,870,654

PROCESS AND CATALYST FOR INCREASING THE MOLECULAR WEIGHT OF LOW-PRESSURE POLYETHYLENE

Gottfried Piekarski, Burghausen, Germany, assignor to Wacker-Chemie GmbH, Munich, Germany

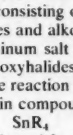
Claims priority, application Germany, Feb. 10, 1972, 2206386

Filed Feb. 7, 1973, Ser. No. 330,278

Int. Cl. B01j *11/84*

U.S. Cl. 252—429 B **8 Claims**

1. In a catalyst for the production of low-pressure polyethylene powder of increased molecular weight consisting essentially of the reaction product of (a) from 1 to 3.5 mols of a polysiloxane containing hydrogen bonded to silicon having the formula



wherein R is a member selected from the group consisting of alkyl having 1 to 6 carbon atoms, cycloalkyl having 5 to 6 carbon atoms and aryl, and the terminal silicons of the polymer are satisfied with R, (b) 1 mol of a titanium compound selected from the group consisting of the halides, oxyhalides and mixtures of the halides and alkoxides, and (c) from 5 to 200 millimols of an aluminum salt selected from the group consisting of halides, alkoxyhalides and alkoxides, the improvement of adding to the reaction mixture in the absence of ethylene, (d) an organic tin compound of the formula

$$SnR_4$$

wherein R is a member selected from the group consisting of alkyl having 2 to 10 carbon atoms and cycloalkyl having 5 to 10 carbon atoms, said ingredient (d) being present in an amount of from 0.5 to 200 millimols per mol of said compound of ingredient (b).

3,870,655

CATALYST FOR THE PREPARATION OF ANTHRAQUINONE

Yoku Nanba, Osaka; Tetsuji Ono, Amagasaki, and Yukio Okuda, Osaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyod Co., Ltd., Osaka, Japan

Filed Jan. 26, 1973, Ser. No. 326,814

Int. Cl. B01j *11/82*

U.S. Cl. 252—435 **11 Claims**

1. A catalyst for the preparation of anthraquinone by vapor phase oxidation of anthracene with a molecular oxygen-containing gas consisting essentially of a catalytic material supported on an inert carrier, said catalytic material consisting essentially of 100 parts by weight of TiO_2, 1 to 45 parts by weight of V_2O_5 and 0.05 to 15 parts by weight of at least two metal oxides selected from the group consisting of Li_2O, Na_2O, K_2O, Rb_2O, Cs_2O and Tl_2O.

2. A catalyst for the preparation of anthraquinone by vapor phase oxidation of anthracene with a molecular oxygen-containing gas consisting essentially of a catalytic material supported on an inert carrier, said catalytic material consisting essentially of 100 parts by weight of TiO_2, 1 to 45 parts by weight of V_2O_5, 0.05 to 15 parts by weight of at least two metal oxides selected from the group consisting of Li_2O, Na_2O, K_2O, Rb_2O, Cs_2O and Tl_2O, 0.05 to 5 parts by weight of P_2O_5 and 0.05 to 5 parts by weight of Nb_2O_5.

3,870,656

PREPARATION OF SILICA-CONTAINING COMPOSITIONS

Terry D. Brown; Joseph A. Delap, and Benny E. Nasser, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 25, 1972, Ser. No. 256,900

Int. Cl. B01j *11/36, 11/06*

U.S. Cl. 252—451 **10 Claims**

1. A method of preparing a silica-containing composition which comprises:

a. forming a hydrogel comprising silica;

b. contacting said hydrogel with an organic compound to form a composite comprising silica and an azeotropic mixture of water and said organic compound;

c. distilling said composite in a distillation zone to produce an overhead stream comprising said organic compound and water and to produce a xerogel;

d. passing said overhead stream into contact with a coalescing material to separate water from said organic compound;
e. passing said organic compound from contact with said coalescing material to said distillation zone; and,
f. recovering said xerogel from said distillation zone as said silica-containing composition.

3,870,657
ALUMINA-SUPPORTED CATALYSTS HAVING SUBSTANTIAL AREA IN LARGE PORES

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 81,600, Oct. 16, 1970, Pat. No. 3,726,936. This application Jan. 17, 1973, Ser. No. 324,392
Int. Cl. B01j *11/06*; B01j *11/32*
U.S. Cl. 252—464 9 Claims

1. A catalyst consisting essentially of a porous alumina support, at least one metal selected from the group consisting of nickel, iron and cobalt and at least one material selected from the group consisting of antimony and arsenic, said catalyst being in a reduced state, a substantial portion of the surface area of said support being in pores having a diameter not less than 500 A, said pores of said diameter comprising a surface area of not less than 2 square meters per gram of said catalyst.

3,870,658
COPPER CHROMITE-ALUMINA CATALYSTS HAVING HIGH-TEMPERATURE STABILITY

Robert J. Farrauto, Painted Post; Karl E. Hoekstra, Corning, and Robert D. Shoup, Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,293
Int. Cl. B01j *11/22*
U.S. Cl. 252—465 2 Claims

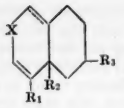
1. A leached copper chromite-alumina catalyst having a composition consisting essentially of 5–25% alumina and the remainder copper chromite by weight, said catalyst consisting essentially of crystal phases of Al_2O_3 and $CuCr_2O_4$ and being resistant to the formation of the crystal phase $Cu_2Cr_2O_4$, said catalyst being formed by:
a. preparing an aqueous solution of a mixture of an aluminum salt or alumina, a copper salt, and a chromium salt or chromium oxide wherein the copper-to-chromium atom ratio exceeds 0.5:1, drying to remove water and sintering to produce a product containing Al_2O_3, $CuCr_2O_4$ and excess CuO; and
b. removing the excess CuO from the product by leaching with a strong mineral acid to produce a catalyst wherein the copper-to-chromium atom ratio is about 0.5:1.

3,870,659
BICYCLIC ODORANTS

Giulinao Bozzato, Kusnacht; Mario Pesaro, Zurich; Peter Schudel, Wetzikon; Marianne Hug-Inderbitzin, Schwerzenbach, all of Switzerland, and Robert Edward Erickson, Westfield, N.J., assignors to Givaudon Corporation, Clifton, N.J.

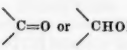
Division of Ser. No. 111,736, Feb. 1, 1971, Pat. No. 3,819,711. This application Sept. 21, 1973, Ser. No. 399,593
Claims priority, application Switzerland, Feb. 19, 1970, 2394/70
Int. Cl. C11b *9/00*
U.S. Cl. 252—522 4 Claims

1. An odorant composition containing an olfactible amount of a compound having the formula



I

wherein R_1 and R_2 signify hydrogen or methyl, but at least one of the symbols R_1 or R_2 signifies hydrogen, X represents one of the residues



R_3 is isopropyl, isopropenyl or isopropylidene and the symbol represents a C—C single bond or C=C double bond in a carrier.

3,870,660
METHOD OF CLEANING HAIR

Stanley C. Paviak, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 90,835, Nov. 18, 1970, abandoned. This application Nov. 20, 1972, Ser. No. 307,960
Int. Cl. C11d *1/18*
U.S. Cl. 252—545 6 Claims

1. A method of cleansing hair which comprises adding to the hair sufficient water and a shampoo composition consisting essentially of an aqueous solution of from about five to about 40 weight percent of an alkali metal, ammonium, or mono, di, or triethanolamine alpha-olefin sulfonate prepared from at least one normal alpha-olefin in having from 14 to 18 carbon atoms and about two to about 15 weight percent based on the alpha-olefin sulfonate salt of a primary normal of 2-methyl alkanol having from 10 to 15 carbon atoms to result in a wet, creamy, stable lather upon manipulation; manipulating said hair containing the shampoo composition and water to produce a wet, creamy, stable lather and cleanse the hair of foreign matter; and water rinsing said foam and foreign matter from said hair.

3,870,661
FOAMED REACTION PRODUCT OF A RESOLE WITH A SULFONATED NOVOLAC

Peter John Crook, Billinge, and Stephen Philip Riley, Saint Helens, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed July 28, 1972, Ser. No. 275,999
Claims priority, application Great Britain, July 30, 1971, 36015/71
Int. Cl. C08g *53/08*; C08j *1/26*
U.S. Cl. 260—2.5 F 37 Claims

1. A foamed phenol-formaldehyde resin comprising the product of condensing at least one phenol with formaldehyde in proportions of 1 mole phenol to not more than 1 mole formaldehyde, at a pH not greater than 7, to form a novolac resin, subsequently sulphonating the novolac resin so as to incorporate sulphonic acid groups therein, and reacting said sulphonated novolac resin with a resole resin in the presence of a surfactant and a foaming agent to form said solid foam.

3,870,662
NOVEL FOAMED MULTIPHASE THERMOPLASTIC COPOLYMER COMPOSITIONS

Robert D. Lundberg, 4 Brian Dr., Somerville, N.J. 08876

Filed Mar. 29, 1973, Ser. No. 345,971
Int. Cl. C08f *47/10*; C08g *53/10*; C08j *1/28*
U.S. Cl. 260—2.5 R 10 Claims

1. A composition of matter which comprises a foamed product derived from a multiphase thermoplastic copolymer having an average molecular weight of at least 10,000, selected from the group consisting of copolymers represented by graft copolymers having the general formula

$$\begin{matrix} B \\ | \\ (A)_m \end{matrix}$$

and block copolymers having the general formula $xB-(AB)_n-yA$ wherein n is an integer 1, m is >1, x and y are 0 or 1, and y is 1 when n is 1, A is a thermoplastic polymer block, and B is a thermoplastic polymer block having a softening point of at least about 35°C., said softening point being at least 10°C. below that of the A block, and which comprises from about 50 to about 97 weight percent of said copolymer, said foamed product having a density of about 1.0 lb./cubic foot to about 45 lbs/cubic foot.

3,870,663

POROUS STYRENE POLYFUNCTIONAL METHACRYLATE POLYMERS

David H. Clemens, Willow Grove, and Herman C. Hamann, Melrose Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 267,336, June 29, 1972, Pat. No. 3,817,878, which is a continuation-in-part of Ser. No. 155,279, June 21, 1971, abandoned, which is a continuation-n-part of Ser. No. 884,325, Dec. 11, 1969, abandoned. This application Feb. 27, 1974, Ser. No. 446,555

Int. Cl. C08f *19/10, 19/20*

U.S. Cl. 260—2.5 B **7 Claims**

1. A porous, resinous polymer consisting essentially of a polymerized mixture of from 60 percent to 99.9 percent by weight of styrene and from 0.1 percent to 40 percent of a methacrylate monomer selected from the class consisting of trimethylolpropane trimethacrylate, pentaerithritol trimethacrylate, pentaerithritol tetramethacrylate, and glycerol trimethacrylate or a mixture of said methacrylate monomer with a minor amount of divinylbenzene.

3,870,664

RESINOUS REACTION PRODUCT OF A SUCROSE PARTIAL ESTER, A CYCLIC DICARBOXYLIC ACID ANHYDRIDE AND A DIEPOXIDE

Raymond Noel Faulkner, Esher, England, assignor to Research Corporation, New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,135

Claims priority, application Great Britain, Jan. 19, 1973, 3010/73

Int. Cl. C08b *25/00*

U.S. Cl. 260—9 **28 Claims**

1. An oil-modified sucrose resin which is the reaction product at reaction temperatures below those at which substantial charring or decomposition of the sucrose takes place of (a) a sucrose partial ester wherein the ester groups are derived from the class consisting of fatty acids, aromatic acids, and vegetable and marine oil unsaturated fatty acids of the drying oil, semi-drying oil and non-drying oil types, and mixtures thereof, (b) at least about two moles of a cyclic dicarboxylic acid anhydride per mole of sucrose partial ester and (c) about 0.7 to about 3 moles of a diepoxide per mole of sucrose partial ester.

3,870,665

PROCESS FOR MAKING PRESSURE MOLDED LIGNOCELLULOSE ARTICLES COMPRISING ISOCYANURATE GROUP FORMING MOLD RELEASE AGENT

Hans-Joachim Diehr, Wuppertal, Germany; Karl-Josef Kraft, Coraopolis, Pa., and Hanns Immo Sachs, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 9, 1974, Ser. No. 468,788

Claims priority, application Germany, May 22, 1973, 2325926

Int. Cl. C08g *51/18*

U.S. Cl. 260—17.2 **16 Claims**

1. In a process for compression molding of lignocellulose-containing materials wherein an organic polyisocyanate is mixed with the materials during molding, the improvement which comprises including a catalyst which promotes isocyanurate formation from isocynates in the mixture as a mold release agent.

3,870,666

CURING AGENT FOR AQUEOUS EPOXIDE RESIN DISPERSIONS

Wilhelm Becker, Hamburg, Germany, assignor to Reichhold-Albert Chemie Aktiengesellschaft, Hamburg, Germany

Filed July 18, 1973, Ser. No. 380,343

Claims priority, application Switzerland, July 25, 1972, 11106/72

Int. Cl. C08g *45/10*

U.S. Cl. 260—21 **10 Claims**

1. Curing agent for aqueous epoxide resin dispersions, which is an association compound of

1. a polyamidoamine-epoxide adduct of a stoichiometric excess of
   a. a polyamidoamine having an amine number of from about 80 to about 450 obtained from
      i. an alkylene polyamine having from 2 to 6 nitrogen atoms and wherein each alkylene radical has from 2 to 6 carbon atoms, either individually or as mixtures but when mixtures are used the ethylenediamine and propylenediamine contained therein amounts to at least one half of the polyalkylenepolyamines used; and
      ii. a polymeric fatty acid obtained by polymerization of drying or semi-drying oils containing mono-, di- or trimerized fatty acids containing 8 to 24 carbon atoms in the monomeric form, or the methyl, ethyl, propyl or butyl esters of such fatty acids, or an amide-forming derivative of such fatty acid with an aromatic vinyl compound, in a molar ratio of (i) to (ii) between 1:0.2 and 1:5, and
   b. from 5 to 35 percent, by weight, relative to the polyamidoamine (a) of an aliphatic epoxide having from three to six terminal epoxide groups per molecule, and
2. from 5 to 30 percent, by weight, relative to the polyamidoamine (a) of a phenol/formaldehyde/polyamine condensation product wherein the polyamine has from 2 to 8 amino hydrogens inclusive, and the remainder of the polyamine is an aliphatic, araliphatic, cycloaliphatic or heterocyclic moiety.

3,870,667
SURFACE COATING COMPOSITIONS WHICH COMPRISE ALKYD RESIN AND NON-AROMATIC PETROLEUM RESIN

John William Syson, and John Charles Kerridge, both of Stockton-On-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 4, 1973, Ser. No. 366,979

Claims priority, application Great Britain, June 15, 1972, 28070/72

Int. Cl. C09d *3/66, 11/00*

U.S. Cl. 260—22 CB **9 Claims**

1. A surface coating composition which comprises a mixture of an alkyd resin, an aromatic, aliphatic or cycloaliphatic hydrocarbon solvent and a non-aromatic petroleum resin which is the product of polymerization of a petroleum fraction boiling in the range −10° to 80°C. derived from a steam cracked naphtha or gas oil and containing more than one hydrocarbon selected from the group consisting of butene-1, butene-2, isobutene, isoprene, cis-piperylene, trans-piperylene, n-pentane, isopentane, pentene-1, cyclopentadiene, dicyclopentadiene, transpentene-2, 2-methylbutene-2, cyclopentene and cyclopentane and wherein the composition contains 25 to 85% by weight alkyd plus petroleum resin and the petroleum resin is 5 to 15% by weight of the alkyd.

3,870,668
LOW FLUID LOSS ADDITIVE COMPOSITION

Paul W. Fischer, Whittier; David S. Pye, Brea, and Julius P. Gallus, Anaheim, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 29, 1972, Ser. No. 293,389

Int. Cl. C08f *45/52;* **E21b** *43/01*

U.S. Cl. 260—28.5 R **13 Claims**

2. A well treating composition comprising discrete particles of a homogeneous solid solution of (1) about 30 to 75 weight percent of wax; (2) about 10 to 25 weight percent of an oil-soluble polyhydroxy higher fatty acid partial ester surface active agent; (3) about 15 to 35 weight percent of a water-dispersible surface active agent selected from the group consisting of polyoxyethylene alkyl phenols, polyethylene glycol higher fatty acid esters, polyoxyethylene polyhydroxy higher fatter acid esters, polyoxyethylene tertiary fatty amines, and polyoxyethylene fatty amide condensates; (4) about 1 to 4 weight percent of a polymer selected from the group consisting of (i) addition polymers of an olefin having between two and four carbon atoms, (ii) copolymers of an olefin having between two and four carbon atoms and an alkyl acrylate containing not more than four carbon atoms in the alkyl group, (iii) copolymers of an olefin having between two and four carbon atoms and an ester formed by the reaction of butenic acid and an alcohol having no more than four carbon atoms, and (iv) copolymers of olefins having between two and four carbon atoms and an ester formed by the reaction of acetic acid and an unsaturated alcohol having no more than four carbon atoms; and (5) about 0.5 to 5 weight percent of a fatty alcohol containing 10 to 14 carbon atoms.

3,870,669
PROCESS FOR THE MANUFACTURE OF DISPERSIONS OF THERMOSETTING REACTION PRODUCTS

Heinz-Bernard Hofel; Hans-Joachim Kiessling, both of Hamburg; Fred Lampert, Barsbut, and Johann Kuhr, Bargteheide, all of Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

Filed June 18, 1973, Ser. No. 371,045

Claims priority, application Switzerland, June 21, 1972, 9344/72

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **4 Claims**

1. A process for the manufacture of water-dilutable, aqueous dispersions, containing emulsifiers and protective colloids, of thermosetting reaction products of monohydroxybenzene compounds or mixtures of monohydroxybenzene compounds with formaldehyde in water, wherein these components are reacted with one another in water in the presence of basic nitrogen compounds, whilst warming, characterised in that, in a three-stage process

1. first a mixture consisting of alkyl phenol, formaldehyde or formaldehyde donors and basic nitrogen compounds, selected form the group consisting of ammonia, primary and secondary amines and mixtures thereof, and optionally with addition of tert. -amines, are allowed to react in the presence of water and in the absence of emulsifiers, whilst warming at the boil, under reflux until the formaldehyde, the ammonia and any primary or secondary amine have practically been condensed into the product, alkyl phenol and formaldehyde being employed in a molar ratio of 1:1 to 1:2 and the basic nitrogen compound selected from the group consisting of ammonia and/or primary or secondary amines, the ratio of alkyl phenol to the active H equivalent weight of the basic nitrogen compound selected from the group consisting of ammonia, primary and secondary amines, and mixtures thereof is 1:1, after removing of the optionally added tert. -amines by distillation,

3 2. phenol, at least one non-ionic emulsifier which is compatible with phenolic resin, and formaldehyde or formaldehyde donors are added to the condensation product obtained in above part (1) which does not contain free ammonia and/or primary or secondary amines, the ratio of the added phenol to the alkyl phenol already condensed into the condensation product being so chosen that the average functionality of the sum of the phenolic compounds towards formaldehyde is between 2.1 and 2.8, and the amount of formaldehyde being so chosen that the molar ratio of the total sum of added formaldehyde to the sum of the phenolic compounds from stages (1) and (2) is between 0.9 and 1.5:1, and the batch is warmed at the boil, under reflux, until a sample of the condensation product, when withdrawn, has a curing time of 6–15 minutes at 160°C, the batch is cooled to below 100°C and the resulting water-in-phenolic resin dispersion, of the water-in-oil type, is

(3.) (3.) with water and protective colloid and agitated mechanically until a phase inversion of the dispersion has taken place, so that a dispersion of the oil-in-water type is present, and the "phenolic resin-in-water dispersion" is further condensed, by warming, until a sample of the dispersions, when withdrawn, has a curing time of 30 seconds to 10 minutes at 160°C, and thereafter the batch is cooled whilst stirring.

3,870,670
PROCESS FOR THE MANUFACTURE OF DISPERSIONS OF THERMOSETTING REACTION PRODUCTS

Heinz-Bernhard Hofel; Hans-Joachim Kiessling, both of Hamburg; Fred Lampert, Barsbuttel, and Johann Kuhr, Bargteheide, all of Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

Filed June 18, 1973, Ser. No. 370,962

Claims priority, application Switzerland, June 21, 1972, 9345/72; June 19, 1972, 9197/72; May 14, 1972, 6796/72

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **5 Claims**

1. Process for manufacture of water-dilutable, aqueous dispersions containing emulsifiers and protective colloids of thermosetting reaction products of mixtures of monohydroxybenzene compounds with formaldehyde in water, wherein these components are reacted with one another in water in the presence of basic nitrogen compounds, whilst warming, characterised in that, in a two-stage process

1. in the first step: a mixture (A) consisting of: one or more substituted phenols which contain, as substituents, alkyl radicals with 1–30 C atoms, cycloalkyl radicals with 5–10 C atoms which can be of monocyclic or bicyclic struc-

ture, alkenyl radicals with 1–30 C atoms and/or cycloalkenyl radicals with 5–10 C atoms, which are again of monocyclic or bicyclic structure, halogen-substituted phenols and aryl-substituted phenols having an aromatic ring in the substituent, and which have at least one but no more than two carbon atoms in the phenolic ring being reactive with formaldehyde, with the condition that the speed of reaction of the substituted phenol with formaldehyde is 40 to 150 percent of the speed of reaction of the unsubstituted phenol, and

phenol

or

a mixture (B) consisting of: one or more substituted phenols which contain, as substituents alkyl radicals with 1–30 C atoms, cycloalkyl radicals with 5–10 C atoms which can be of monocyclic or bicyclic structure, alkenyl radicals with 1–30 C atoms and/or cycloalkenyl radicals with 5–10 C atoms, which are again of monocyclic or bicyclic structure, halogen-substituted phenols having an aromatic ring in the substituent, and which have at least one but no more than two carbon atoms in the phenolic ring being reactive with formaldehyde, with the condition that the speed of reaction of the substituted phenol with formaldehyde is 40 to 150 percent of the speed of reaction of the unsubstituted phenol, and

one or more other substituted phenols which contain, as substituents, alkyl radicals with 1–30 C atoms, cycloalkyl radicals with 5–10 C atoms which can be of monocyclic or bicyclic structure, alkenyl radicals with 1–30 C atoms and/or cycloalkenyl radicals with 5–10 C atoms, which are again of monocyclic or bicyclic structure, halogen-substituted phenols and aryl-substituted phenols having an aromatic ring in the substituent, and which have three carbon atoms in the phenolic ring which are reactive with formaldehyde, with the condition that the speed of reaction of the substituted phenol with formaldehyde is 40 to 150 percent of the speed of reaction of the unsubstituted phenol, or

a mixture (C) consisting of: one or more substituted phenols which contain, as substituents, alkyl radicals with 1–30 C atoms, cycloalkyl radicals with 5–10 C atoms which can be of monocyclic or bicyclic structure, alkenyl radicals with 1–30 C atoms and/or cycloalkenyl radicals with 5–10 C atoms, which are again of monocyclic or bicyclic structure, halogen-substituted phenols and aryl-substituted phenols having an aromatic ring in the substituent, and which have at least one but no more than two carbon atoms in the phenolic ring being reactive with formaldehyde, with the condition that the speed of reaction of the substituted phenol with formaldehyde is 40 to 150 percent of the speed of reaction of the unsubstituted, phenol, and

phenol

and

one or more other substituted phenols which contain, as substituents, alkyl radicals with 1–30 C atoms, cycloalkyl radicals with 5–10 C atoms which can be of monocyclic or bicyclic structure, alkenyl radicals with 1–30 C atoms and/or cycloalkenyl radicals with 5–10 C atoms, which are again of monocyclic or bicyclic structure, halogen-substituted phenols and aryl-substituted phenols having an aromatic ring in the substituent, and which have three carbon atoms in the phenolic ring which are reactive with formaldehyde, with the condition that the speed of reaction of the substituted phenol with formaldehyde is 40 to 150 percent of the speed of reaction of the unsubstituted phenol, is mixed with formaldehyde or formaldehyde donors and basic nitrogen compounds, selected from the group consisting of ammonia and/or primary or secondary amines, the mixture A, B or C being employed in such ratios that the average functionality of the sum of the phenolic compounds in the mixture A, B or C relative to formaldehyde is between 2.1 and 2.8, and the amount of formaldehyde being so chosen that the molar ratio of the total sum of added formaldehyde to the sum of the phenolic compounds in the mixture A, B or C is between 0.9 and 1.5:1, the basic nitrogen compound being employed in amounts of 5 to 50 mol percent relative to the total weight of phenol components in the mixture A, B or C, and warmed at the boil under reflux for reaction until a sample of the condensation product when withdrawn has a curing-time of 6 to 15 minutes at 160°C, the batch is cooled to below 100°C and the resulting water-in-phenolic resin dispersion of a water-in-oil type is

2. in the second step: mixed with water and protective colloid and agitated mechanically until a phase inversion of the dispersion takes place, so that a dispersion of the oil-in-water type is present, and the phenolic resin-in-water-type dispersion is further condensed, by warming, until a sample of the dispersion, when withdrawn, has a curing-time of 30 seconds up to 10 minutes at 160°C, and thereafter the batch is cooled whilst stirring.

3,870,671

METHOD FOR DISPERSING

Alois Aignesberger, Trostberg; Ulrich Kriele, Traunreut, and Horst Michaud, Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke AG, Postfach, Germany

Filed Apr. 4, 1973, Ser. No. 347,893

Claims priority, application Germany, Apr. 13, 1972, 2217929

Int. Cl. C08g *9/32, 9/30, 51/24;* **B01f** *17/52*

U.S. Cl. 260—29.4 R **5 Claims**

1. A method for dispersing finely divided, water-insoluble solids, comprising dialyzing a sulfite, amidosulfonic acid or sulfonic acid modified melamine-formaldehyde resin, the sulfite or sulfonic acid group of which is in the form of a sodium salt, said resin being of a molecular weight between 5,000 and 50,000, admixing said resin in an amount from 1 to 10 percent by weight with said finely divided water-insoluble solid, in an aqueous medium having a pH range above 6.5 and dispersing said solid in said aqueous medium in the presence of said resin.

3,870,672

WATER COMPATIBLE POLYESTER BORATE COMPOSITIONS

Julio Lopez Mesa, 638-B Salem St., Glendale, Calif. 91203

Continuation-in-part of Ser. No. 103,807, Jan. 4, 1971, abandoned. This application Aug. 28, 1972, Ser. No. 283,944

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 NR **15 Claims**

1. A curable, water extendable water-in-oil emulsion comprising:

a. a resin system comprising at least one unsaturated polyester resin prepared by the reaction of a polybasic carboxylic acid and a dihydric alcohol and including at least one unsaturated monomer cross-linkable herewith;

b. at least one water soluble, basic inorganic borate salt as the emulsifying agent; and

c. an amount of water at least sufficient to dissolve said basic inorganic borate salt to form the emulsion.

3,870,673

PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS OF A VINYL ESTER-ETHYLENE-AN ACRYLAMIDE BEING FREE FROM EMULSIFIERS

Karl Josef Rauterkus, Kelkheim/Taunus, and Jan Blazek, Bad Soden/Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Jan. 17, 1973, Ser. No. 324,412

Claims priority, application Germany, Jan. 18, 1972, 2202189

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 TA **3 Claims**

1. An aqueous polymer dispersion being free from emulsifiers and having a polymer content of from **40** to **65**% by weight, said polymer consisting essentially of units of at least one vinyl ester of a saturated aliphatic monocarboxylic acid having from one to **18** carbon atoms, ethylene, and from **2** to **15**% by weight, based on said vinyl ester, at least one acrylamide component of the formula

$$CH_2{=}CX{-}CO{-}NHY$$

wherein X is hydrogen or a methyl group, Y is hydrogen or the group $-CH_2-O-Z$, and Z is hydrogen or an alkyl or acyl group having up to four carbon atoms, said ethylene derived units in said polymer being in an amount polymerizable with said vinyl ester and said acrylamide at a pressure from **10** to **100** atmospheres.

2. A process for the preparation of an aqueous polymer dispersion as claimed in claim **1** which comprises polymerizing the monomers at a pressure of from **10** to **100** atmospheres and a temperature from **40°** to **100°** C in the presence of a redox initiator system comprising an organic peroxide or hydroperoxide and a water-soluble reducing agent.

3,870,674

PARTICULATE POLYIMIDE COMPOSITIONS CONTAINING PHENAL OR DIPOLAR APROTIC SOLVENTS

William J. Farrissey, Jr., and Karl W. Rausch, Jr., both of New Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 16, 1974, Ser. No. 433,809

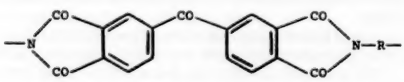
Int. Cl. C08g *51/44, 51/34, 51/46*

U.S. Cl. 260—30.2 **7 Claims**

1. A solid particulate, non-cellular, polyimide composition having a softening point in the range of about 50°C to about 150°C and comprising a blend of

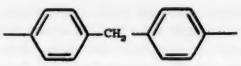
a. from about 85 percent to about 65 percent by weight of a copolyimide selected from the class consisting of

i. a copolyimide characterized by the recurring unit

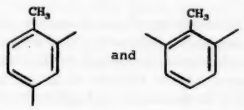


(I)

wherein from 10 to 30 percent of said recurring units are those in which R represents

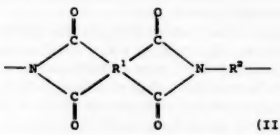


and the remainder of said units are those in which R represents a member selected from the group consisting of



and mixtures thereof; and

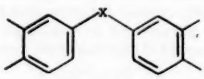
ii. a copolyimide characterized by the recurring unit



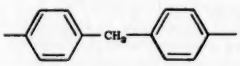
(II)

wherein, in 75 to 100 percent of said recurring units R^1 represents

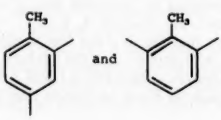
and, in the remaining 0 to 25 percent of said units, R^1 represents



where X is a member selected from the group consisting of CO, O and SO_2; and wherein, in 10 to 35 percent of said recurring units, R^2 represents



and, in the remaining 65 to 90 percent of said units, R^2 represents a member selected from the group consisting of



and mixtures thereof; and

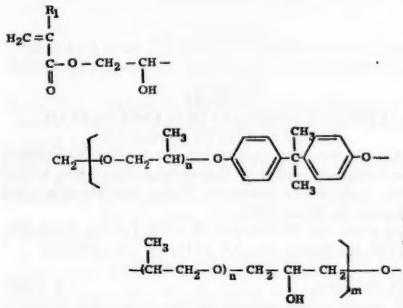
b. from about 15 percent to about 35 percent by weight of at least one member of the class consisting of dipolar aprotic solvents and phenols each having a boiling point which is at least 50°C higher than that of the softening point of said blend and is not higher than about 225°C.

3,870,675
TWO-COMPONENT ADHESIVE

Seiji Kusayama; Koichi Ohashi, and Shinzo Takada, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-shi, Osaka-fu, Japan

Filed July 24, 1972, Ser. No. 274,424
Claims priority, application Japan, July 22, 1971, 46-55028
Int. Cl. C08g *51/34;* **C08f** *19/20*
U.S. Cl. 260—32.8 A **26 Claims**

1. A two-component adhesive comprising of (1) a main composition comprising about 40 to about 80 parts by weight of at least one of divinyl compounds of the formula:



wherein R_1 and R_2 are each hydrogen, methyl or ethyl, n is an integer of 1 to 5 and m is an integer of 1 to 10, about 0.05 to about 10 parts by weight of an organic peroxide, about 2 to about 120 parts by weight of at least one mono-vinylic monomer selected from the group consisting of vinyl acetate, methacrylic acid, acrylic acid, glycidyl methacrylate and β-hydroxyethyl methacrylate (the amount of each mono-vinylic monomer not exceeding 40 parts by weight) and about 0.5 to about 15 parts by weight of at least one rubber material selected from the group consisting of acrylonitrile-butadiene-styrene polymer, acrylonitrile-butadiene rubber and carboxylated NBR and (2) an accelerator composition comprising about 0.01 to about 10 parts by weight of a thiourea compound, about 0.01 to about 10 parts by weight of α, α'-dipyridyl, about 0.001 to about 5 parts by weight of at least one of copper salts, cobalt salts, manganese salts, chromium salts and vanadium salts of organic and inorganic acids and about 75 to about 100 parts by weight of an organic volatile solvent.

3,870,676
STABILIZED BLOCK COPOLYMER COMPOSITIONS

Nancy J. Condon, Long Beach, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1973, Ser. No. 353,866
Int. Cl. C08c *11/22;* **C08g** *45/04;* **C08f** *45/58*
U.S. Cl. 260—33.6 AQ **5 Claims**

1. A block copolymer composition comprising:

a. 100 parts by weight of a block copolymer of the group consisting of copolymers having at least one monoalkenylarene polymer block having an average molecular weight between about 5,000 and 150,000, and at least one conjugated diene polymer block having an average molecular weight between about 20,000 and 500,000 and hydrogenated derivatives thereof wherein at least 95% of the olefinic double bonds are saturated, the monoalkenylarene being selected from the group consisting of styrene, alphamethyl styrene, ring alkylated styrenes and mixtures thereof, and the conjugated diene being selected from the group consisting of butadiene, isoprene and mixtures thereof, and

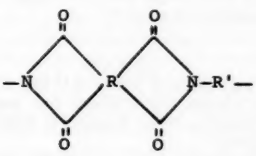
b. 0.5–5 parts by weight of a hydroxyl-containing polyepoxide having an epoxide equivalency greater than 1.0 and an epoxide equivalent weight of between about 200 and 6,000.

3,870,677
HEAT RESISTANT REINFORCED COMPOSITES OF COPOLYIMIDES

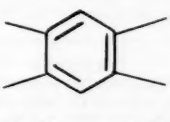
William J. Farrissey, Jr., Northford, and Philip S. Andrews, New Haven, both of Conn.

Division of Ser. No. 310,398, Nov. 29, 1972, Pat. No. 3,787,367. This application Nov. 5, 1973, Ser. No. 412,976
Int. Cl. C08g *51/04, 51/16*
U.S. Cl. 260—37 N **4 Claims**

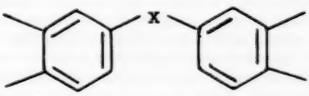
1. A heat resistant reinforced composite comprising a mixture of (1) a copolyimide having the recurring unit



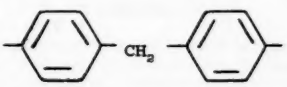
wherein R in 75 – 100 percent of said recurring units represents



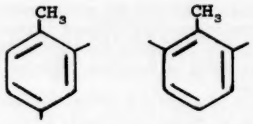
and, in the remaining 0 – 25 percent of said units, represents



where X is a member selected from the group consisting of CO, O, and SO_2; wherein R' in 10 – 35 percent of said recurring units represents



and in the remaining 65 – 90 percent of said units represents a member selected from the group consisting of



and mixtures thereof, and (2) a fibrous reinforcement material.

3,870,678

REACTION PRODUCT OF AN ORGANOMETALLIC COMPOUND AND AN ORGANIC NITRO COMPOUND AS AN ANTIOXIDANT FOR CONJUGATED DIOLEFIN POLYMERS

Gary Allan Harpell, Brecksville, Ohio, assignor to Goodrich-Gulf Chemicals, Inc., Cleveland, Ohio

Division of Ser. No. 116,266, Feb. 17, 1971, Pat. No. 3,754,056. This application Mar. 19, 1973, Ser. No. 342,746

Int. Cl. C08d *11/04*

U.S. Cl. 260—45.9 R **9 Claims**

1. Conjugated diolefin homopolymers or vinyl and conjugated diolefin copolymers are stabilized against oxidative degradation with a stabilizing amount of an antioxidant composition comprising the reaction product of (1) A—M wherein A is an alkyl, aryl, aralkyl or cycloalkyl radical containing from 1 to about 20 carbon atoms and M is an alkali metal and (2) a composition of the formula $Q_m—R—(NO_2)_n$ wherein Q is halogen, hydroxy, alkoxy or aryloxy; R is alkyl, aryl, aralkyl or cycloalkyl containing from 1 to about 20 carbon atoms; *m* is an integer from 0 to about 10 and n is an integer from about 1 to about 4.

3,870,679

SMOKE RETARDANT VINYL HALIDE POLYMERS

Lawrence C. Mitchell, Mount Vernon, Ind., and Gary L. Ter Haar, Farmington, Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 196,802, Nov. 8, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,572

Int. Cl. C08f *45/56*

U.S. Cl. 260—45.75 N **5 Claims**

1. As a composition of matter, a polyvinyl halide admixed with a smoke retardant amount of molybdenum hexacarbonyl.

3,870,680

COPPER INHIBITORS FOR POLYOLEFINS

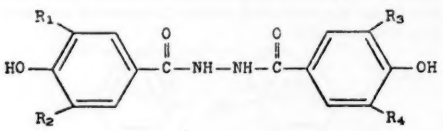
Edward Schurdak, 4 Harry Rd., Somerville, N.J. 08876

Filed Oct. 19, 1973, Ser. No. 408,212

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.85 B **11 Claims**

10. Polypropylene stabilized against copper-catalyzed thermal degradation by the combination of (a) an amount of a hindered-phenol antioxidant sufficient to stabilize said polypropylene against thermal degradation in the absence of copper and (b) an amount of a compound of the formula



wherein R_1, R_2, R_3, and R_4 are each branched-chain alkyl of three to eight carbon atoms sufficient to reduce the effects of copper on such thermal degradation even in the presence of said hindered-phenol antioxidant.

3,870,681

MODIFIED SULFONATED RESIN SURFACTANTS

Sten I. Falkehag, Mount Pleasant, and Carl W. Bailey, III, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,995

Int. Cl. C08g *5/02, 5/18*

U.S. Cl. 260—49 **15 Claims**

1. Reaction products of sulfomethylated phenolic-formaldehyde resins having molecular weights between about 500 and 30,000, and 0.25 moles to 20 moles per 1,000 grams of said resins of chloromethane sulfonate, to give resin adducts with the phenolic hydroxyl at least partially blocked.

3,870,682

ALDEHYDE CONDENSATION PRODUCTS OF FLUORALIPHATIC PHENOLS

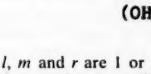
Leland S. Endres, San Luis Obispo, Calif.; Leo F. Gehlhoff, Lake Elmo, and Dallas D. Zimmerman, Shoreview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 85,278, Oct. 29, 1970, Pat. No. 3,832,409. This application Jan. 23, 1974, Ser. No. 435,670

Int. Cl. C08g *5/02, 5/10, 5/16*

U.S. Cl. 260—49 **6 Claims**

1. A condensation polymer having an average molecular weight of about 800 to about 1,500 of the condensation catalyst catalyzed reaction of a phenol of the formula



wherein *l*, *m* and *r* are 1 or 2, *t* is 1; H is a hydrogen atom sufficiently reactive to undergo a catalyzed condensation reaction with an aldehyde; A is an aryl nucleus containing from 6 to 15 carbon atoms; OH is a phenolic hydroxyl group; R_f is a monovalent fluorinated saturated aliphatic radical containing from 3 to 20 carbon atoms and Q is selected from the class consisting of sulfonate, sulfonyl and sulfonamide and a saturated aliphatic aldehyde containing not more than 7 carbon atoms in addition to the aldehyde carbon atom or benzaldehyde.

3,870,683

LIGHT STABLE POLYURETHANES BASED ON DICYCLOHEXYL AND DIISOCYANATES

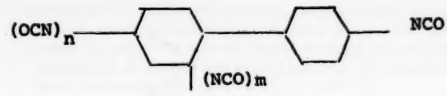
Robert J. Freure, Clarkson, Ontario, and Maurice Moyle, Oakville, Ontario, both of Canada, assignors to Gulf Oil Canada Limited, Toronto, Ontario, Canada

Continuation of Ser. No. 89,050, Nov. 12, 1970, abandoned, which is a division of Ser. No. 839,665, July 7, 1969, abandoned. This application Dec. 21, 1971, Ser. No. 210,599

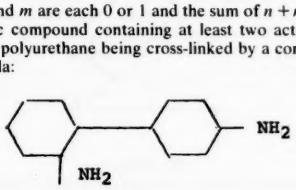
Int. Cl. C08g *22/24, 22/00*

U.S. Cl. 260—75 NT **1 Claim**

1. A polyurethane comprising the reaction product of a diisocyanate of the formula:



where n and m are each 0 or 1 and the sum of $n + m$ is 1, and an organic compound containing at least two active hydrogens, said polyurethane being cross-linked by a compound of the formula:



3,870,684

PREPARATION OF CROSS-LINKED PARTICLES OF POLYURETHANE OR POLYUREA CONTAINING IONIC GROUPS

Harro Witt, Cologne-Buchheim, and Dieter Dieterich, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 43,651, April 29, 1970, abandoned, which is a continuation of Ser. No. 634,086, April 27, 1967, abandoned. This application June 29, 1972, Ser. No. 267,349

Int. Cl. C08g *22/16, 22/30, 51/24*

U.S. Cl. 260—75 NH **8 Claims**

1. A process for the preparation of sedimenting and redispersible cross-linked particles, said particles being insoluble in dimethyl formamide and containing urea groups which comprises dispersing a polyurethane or a polyurea polymer containing free NCO groups and from about 0.001 to about 0.2 equivalent per cent of an ionic group selected from the group consisting of

$$-\overset{|}{\underset{|}{N}}-^{(+)} \quad , \quad -\overset{|}{\underset{|}{P}}-^{(+)} \quad , \quad -\overset{|}{\underset{|}{S}}-^{(+)} \quad ,$$

$$-COO^{-} \quad , \quad -SO_2O^{-} \quad , \text{ and } \quad -\overset{|}{P}OO^{-}$$

in water in the presence of an organic aliphatic polyamine containing a total of at least three primary and/or secondary amino groups of which groups at least two are primary amino.

3,870,685

CATALYTIC METHOD FOR PRODUCING AROMATIC POLYAMIDES

Rufus S. Jones, Dover, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed June 15, 1973, Ser. No. 370,273

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **13 Claims**

1. A method for preparing high molecular weight aromatic carbocyclic polyamides comprising heating in the substantial absence of oxygen an aromatic carbocyclic dicarboxylic acid and an aromatic carbocyclic diamine in about a mole to mole ratio in the presence of about 2,500 to 2500 percent, by weight, based on the polymer weight, of an aryl sulfone and about 0.2 to 15 mole percent, based on the reactants, of a combination of boric acid and an, aryl or alkyl sulfonic acid of from 1 to 16 carbon atoms wherein the molar ratio of the boric acid to organic sulfonic acid is between about 10:1 and 1:10, to a temperature above the melting point of said sulfone to just below the decomposition temperature of the reactants and continuing said heating with the removal of condensation by-products for a period of time sufficient to form a product having an inherent viscosity of at least 0.4 as measured using a solution of 0.4 grams of product per 100 milliliters of concentrate, 97–99% by weight, aqueous sulfuric acid at 25°C.

3,870,686

ARYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,771

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 **26 Claims**

1. A method of producing a polymer which comprises:

a. forming a composition by contacting at least one polyhalo-substituted aromatic compound wherein the halogen atoms are attached to aromatic ring carbon atoms, at least one organic amide, at least one organic sulfur-containing compound selected from the group consisting of mercaptans, mercaptides and sulfides, each having an alpha or a beta activating substituent, and at least one base selected from the hydroxides of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium; and,

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,870,687

ARYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,781

Int. Cl. C08g *25/00*

U.S. Cl. 260—79.1 **22 Claims**

1. A method of producing polymers which comprises:

a. forming a composition by contacting at least one polyhalo-substituted aromatic compound in which the halogen atoms are attached to aromatic ring carbon atoms, at least one sulfur-containing compound selected from thiocarboxylic acids and thiocarboxylates, at least one base selected from the hydroxides of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium, and at least one organic amide, said sulfur-containing compound having the formula $R[CXS(M/y)]_n$, wherein R is a hydrocarbon radical having one to 20 carbon atoms and a valence of n; n is an integer having a value within the range of 1 to 4; X is selected from oxygen and sulfur; M is hydrogen or a metal selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, and barium; and y is the valence of M; and,

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,870,688

TITANIUM TARTRATE CATALYZED POLYESTERIFICATION

Osamu Makimura, and Teruo Goto, both of Ohtsu, Japan, assignors to Toyoboseki Kabushiki Kaisha, Osaka-fu, Japan

Continuation-in-part of Ser. No. 251,979, May 10, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,304

Claims priority, application Japan, May 12, 1971, 46-31838; Dec. 23, 1971, 46-2512

Int. Cl. C08g *17/015*

U.S. Cl. 260—75 R **9 Claims**

1. In the polycondensation of an alkylene glycol-aromatic dicarboxylic acid ester reaction mixture, the improvement which comprises adding a catalytic amount of a titanium tartrate compound to the reaction mixture and polycondensing said ester in the presence of said titanium tartrate compound.

3,870,689
CRYSTALLINE COPOLYMERS OF ETHYLENE AND TETRAFLUOROETHYLENE HAVING HIGH WORKABILITY CHARACTERISTICS

Mario Modena, Bollate; Mario Ragazzini, Milan; Giancarlo Borsini, Rome, and Marco Valera, Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 143,637, May 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 730,190, May 17, 1968, abandoned. This application Aug. 16, 1973, Ser. No. 388,910

Int. Cl. C08f *1/06, 15/02*

U.S. Cl. 260—87.5 B 2 Claims

1. A process for preparing crystalline ethylene/tetrafluoroethylene copolymers containing from 53 to 63% by moles of tetrafluoroethylene homogeneously distributed along the copolymeric chain axis and among the chains, having a high degree of thermal stability, and showing a temperature gap of at least 80°C, measured by differential thermal analysis, between their ultimate melting temperature and the temperature at which oxidative decomposition of the copolymers begins, said process being characterized in that the starting mixture of ethylene and tetrafluoroethylene which is copolymerized to obtain the copolymers contains more than 78% of tetrafluoroethylene by moles and the concentration of tetrafluoroethylene in the mixture of monomers is maintained above 78% by moles and essentially during the copolymerization reaction.

3,870,690
PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Wolfgang Gordon, Hofheim, Taunus; Kurt Rust, Frankfurt am Main, and Erwin Schrott, Sulzbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 10, 1973, Ser. No. 349,755

Claims priority, application Germany, Apr. 15, 1972, 2218345

Int. Cl. C08f *15/04, 19/02, 3/02*

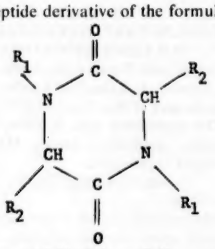
U.S. Cl. 260—88.2 R 4 Claims

2. In a process for the preparation of a crystalline polyolefin by polymerization of at least one α-olefin of the formula CH_2=CH—R, wherein R represents an aliphatic radical having one to four carbon atoms, in suspension or in the gas phase, at a temperature of from 20° to 130°C. and a pressure of from 1 to 50 kg/cm², the improvement which comprises carrying out the polymerization in the presence of a mixed catalyst prepared from

a. a halogen compound of trivalent titanium (component A)

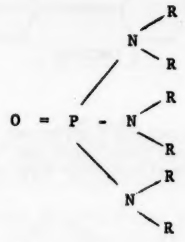
b. a halogen-free organo-aluminum compound (component B) and

c. a cyclic dipeptide derivative of the formula



wherein R_1 represents C_6H_5-CH_2 or C_nH_{2n+1} and n = 1 to 4, and R_2 represents H, C_6H_5-CH_2 or $C_n H_{2+1}$ and n = 1 to 4 (component C) and

d. a phosphoric acid-N-alkyl amide of the formula



wherein R represents identical or different aliphatic hydrocarbon radicals having up to four carbon atoms and wherein the radicals R can also be connected with one another (component D).

3,870,691
METHOD FOR POLYMERIZING TETRAFLUOROETHYLENE AND THE POLYMERS OBTAINED THEREFROM

Edouard Grimaud, Oullins, and Claude Tournut, Saint Genis Laval, both of France, assignors to Pechiney Ugine Kuhlmann, Paris, France

Filed Sept. 8, 1972, Ser. No. 287,255

Claims priority, application France, Sept. 13, 1971, 71.32874

Int. Cl. C08f *3/24*

U.S. Cl. 260—92.1 5 Claims

1. A method for polymerizing tetrafluoroethylene in an aqueous suspension comprising initiating polymerization in the absence of any other polymerization initiating agent with a tetrafluoroethylene polymer initiator previously prepared by coagulation of a dispersion of polytetrafluoroethylene being about 0.1 to about 0.5 microns obtained by polymerization of tetrafluoroethylene in an emulsion.

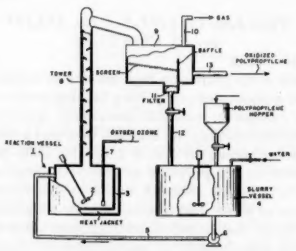
3,870,692
SELECTIVE HYDROPEROXIDATION OF POLYOLEFINS IN AN AQUEOUS SLURRY

Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 633,789, April 26, 1967, abandoned. This application July 12, 1971, Ser. No. 161,819

Int. Cl. C08f *27/22*

U.S. Cl. 260—93.7 7 Claims



1. A process for selective hydroperoxidation of finely divided solid polypropylene particles, which consists essentially of:

contacting a cationic surfactant-free, slurry of said polypropylene, having a particle size of about 30 to 1,000 microns in water with a 50 to 90 mg. of ozone per liter of air mixture as the sole free radical initiator, at a temperature within the range of from 75° C. to 95° C.,

and for a time sufficient to obtain a hydroperoxide concentration in said polypropylene between 0.014 and 0.050 weight percent,

whereby formation of higher oxidation products than hydroperoxides is significantly less than said formation at temperatures outside said 75° C. to 95° C. range.

3,870,693

HOMOPOLYMERIZATION OR COPOLYMERIZATION OF ETHYLENE

Karl Wisseroth, 80 Wittelsbachstrasse, 6700 Ludwigshafen, Germany

Filed Jan. 26, 1972, Ser. No. 221,029

Int. Cl. C08f *1/66*

U.S. Cl. 260—94.9 D **6 Claims**

1. In a process for the polymerization of ethylene and mixtures of ethylene and up to 50 percent by weight of propene and/or butene-1 with the aid of a low-pressure catalyst and wherein said catalyst is formed by heating a carrier material containing silica and/or alumina and impregnated with a chromium compound to temperatures above 300°C in an oxygen-containing stream of gas to activate said catalyst, the improvement which consists essentially of exhaustively extracting said activated catalyst with water to remove water soluble chromium therefrom, drying said catalyst, and thereafter reactivating said catalyst by reheating said catalyst in an oxygen-containing stream of gas to temperatures between 250° and 400°C.

3,870,694

PEPTIDE SYNTHESIS WITH N-HYDROXY-5-NORBORNENE-2,3-DICARBOXIMIDE

Masahiko Fujino, Hyogo; Shigeru Kobayashi, Osaka; Mikihiko Obayashi, Osaka; Susumu Shinagawa, Osaka, and Tsunehiko Fukuda, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 13, 1973, Ser. No. 340,893

Claims priority, application Japan, Mar. 14, 1972, 47-26467; Mar. 21, 1972, 47-28740; Mar. 21, 1972, 47-28741

Int. Cl. C07c *103/52*; **C08h** *1/00*

U.S. Cl. 260—112.5 **5 Claims**

1. In a method for producing a peptide which comprises allowing an amino acid or peptide whose N-terminal amino or imino group has been protected to react with an N-hydroximide compound in the presence of a carbodiimide reagent to produce an N-hydroximide ester of an amino acid or peptide whose N-terminal group is protected and allowing thus produced N-hydroximide ester to react with an amino acid, peptide or derivative thereof whose N-terminal amino or imino group is free and optionally liberating the protected peptide into the free form, with the proviso that:

1. if the amino acid or peptide whose N-terminal amino or imino group has been protected has free functional group or groups in side chain, none, some or all of these functional group or groups are protected, and

2. if the amino acid or peptide derivative whose N-terminal amino or imino group is free has free functional group or groups in side chain or/and a C-terminal carboxyl group, none, some or all of these groups are protected, the improvement wherein 2,3N-hydroximide compound is N-hydroxy-5-norbornene-a-dicarboximide.

3,870,695

HEAVY METAL COMPLEXES OF AZO DYESTUFFS CONTAINING A 2-AMINO-3-HYDROXYPYRIDINE AS COUPLING COMPONENT

Gerhard Back, Loerrach, Germany, and Arthur Buehler, Rheinfelden, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

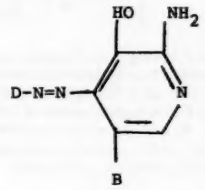
Filed July 21, 1972, Ser. No. 274,147

Claims priority, application Switzerland, July 27, 1971, 11034/71

Int. Cl. C09b *45/14, 45/20, 45/24*

U.S. Cl. 260—146 R **2 Claims**

1. The copper, nickel, chromium or cobalt complex of a compound of formula



in which B is chloro, bromo or hydrogen;

D is phenyl or naphthyl that contains, in the position ortho to the azo bridge, hydroxyl, amino or carboxyl, and where said phenyl is further unsubstituted or substituted by chloro, bromo, methyl, nitro, cyano, methylsulphonyl, trifluoromethyl, carbomethoxy, carboethoxy, hydroxyethylsulphonyl, chloroethylsulphonyl, sulfonamido, N-methylsulphonamido, N,N-dimethylsulphonamido, N,N-diethylsulphonamido, N,N-di(hydroxyethyl) sulfonamido, N-phenylsulfonamido, methoxy, sulfophenylazo, sulfonaphthylazo phenylazo, acetylamino, acetyl, $CONH_2$, tosylamino, or a fibre-reactive acylamino group where fibre-reactive acyl is selected from the group consisting of chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, acrylyl, β-chloroacrylyl, β-bromoacrylyl, α-chloroacrylyl, α-bromoacrylyl, α,β-dichloroacrylyl, α,β-dibromoacrylyl, trichloroacrylyl, chlorocrotonyl and propiolyl,

and where

said naphthyl is further unsubstituted or substituted by sulfo, sulfonamido, nitro, acetylamino or sulfophenylazo.

3,870,696

BENZTHIAZOLE-AZO-(4-N-SULFOPROPYL)PHENYL COMPOUNDS

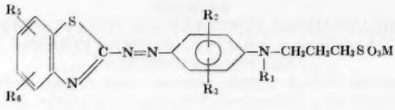
James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 4,096, Jan. 17, 1970, abandoned, and Ser. No. 102,231, Dec. 28, 1970, abandoned. This application July 5, 1973, Ser. No. 376,604

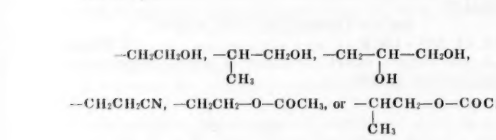
Int. Cl. C09b *29/08, 29/26*

U.S. Cl. 260—158 **6 Claims**

1. A compound having the structure:



wherein R_1 is alkyl having from 1 to 8 carbon atoms, benzyl, cyclohexyl,



R_2 is —H, -alkyl having 1 to 4 carbon atoms, halogen, —O— alkyl having 1 to 4 carbon atoms or —NHCOR$_4$;

R_3 represents —H, -alkyl having 1 to 4 carbon atoms, —O— alkyl having 1 to 4 carbon atoms or —NH—COR$_4$;

R_4, as used in R_2 and R_3, represents -alkyl having 1 to 4 carbon atoms, -tolyl, -phenyl or -halophenyl;

R_5 is —H, —NO$_2$, halogen, —SO$_2$-alkyl, -alkyl and —O— alkyl;

R_6 is —H, —NO$_2$, halogen and alkyl; and

M is —H, —Na, —K, —Li or —NH$_4$.

3,870,697

TRISAZO DYESTUFFS CONTAINING TWO CARBOXAMIDE GROUPS

Alfred Froehlich, Marly-Le-Grand, and Hansrolf Loeffel, Bern, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

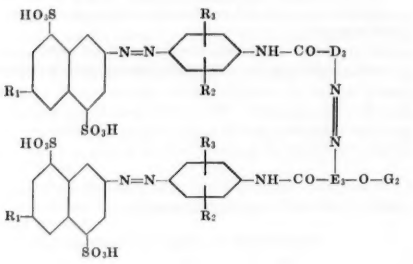
Continuation of Ser. No. 798,792, Feb. 12, 1969, abandoned. This application Oct. 2, 1972, Ser. No. 293,964

Claims priority, application Switzerland, Feb. 15, 1968, 2253/68

Int. Cl. C09b *43/12*

U.S. Cl. 260—173 **8 Claims**

1. A trisazo dyestuff of the formula



wherein R_1 denotes hydrogen, halogen, nitro or sulphonic acid, R_2 denotes hydrogen, chlorine, alkyl, alkoxy, hydroxyalkoxy, alkoxyalkoxy in each case having one to five carbon atoms in the alkyl moiety, phenoxy, hydroxyacetic acid, acetic acid or acylamino where acyl represents alkanoyl having one to five carbon atoms or of benzoyl, or carboxyacylamino which is derived from alkylene dioic acid having one to five carbon atoms, R_3 is hydrogen, methyl or methoxy or acylamino in which acyl has the significance given for R_2, D_3 is phenylene, naphthylene, toluylene, anisoylene or chlorophenylene, E_3 is phenylene, naphthylene, toluylene or anisoylene and G_2 is hydrogen, methyl or ethyl, the residues D_3 and E_3—OG_2 being different from one another.

3,870,698

QUINTOMYCIN COMPOUNDS

Katsura Munakata, Nagoya; Takeshi Oda, Tokyo; Toshito Mori, Tokyo, and Hisakatu Ito, Tokyo, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

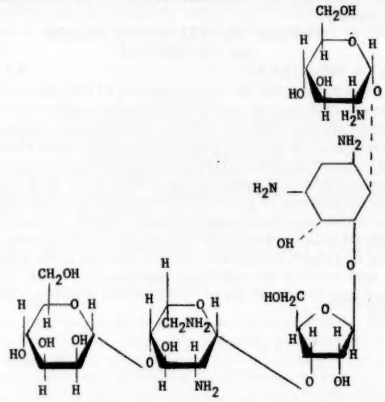
Continuation-in-part of Ser. No. 737,333, June 17, 1968, abandoned. This application Nov. 19, 1971, Ser. No. 200,524

Claims priority, application Japan, June 21, 1967, 42-39296; June 15, 1968, 43-40863

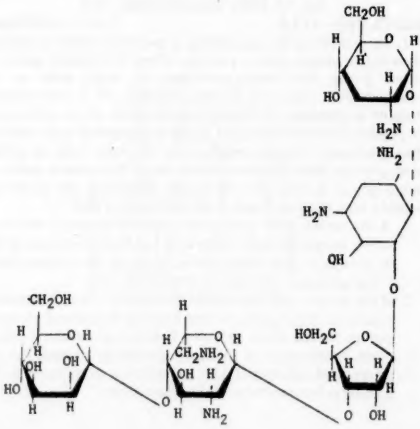
Int. Cl. C07c *129/18*

U.S. Cl. 260—210 AB **4 Claims**

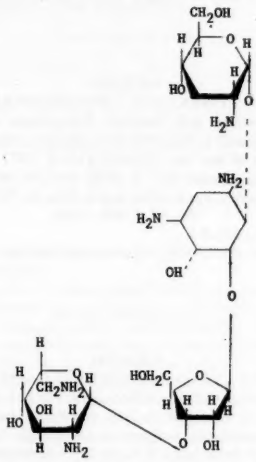
1. Antibiotic Quintomycin of the aminocyclitol group which inhibits the growth of gram-positive bacteria, gram-negative bacteria, and acid-fast bacteria, and contains at least one compound expressed by the chemical name O-α-D-mannopyranosyl(1 → 4), α-L-2,6-diamino-2,6-dideoxy-idopyranosyl(1 → 3), β-D-ribofuranosyl (1 → 5) O-[α-D-2-amino-2-deoxy-glucopyranosyl(1 → 4)] 1,3-diamino-1,2,3-trideoxy-myoinositol, corresponding to the structural formula



and the empirical formula $C_{29}H_{55}N_5O_{19}$, an Rf-value of **0.23**, the pentahydrochloride of which has a specific rotation $[\alpha]_D^{22}$ of + 59° and a decomposition point of 190° to 200°C, and showing the infrared spectrum as in FIG. **1**, a compound expressed by the chemical name O-α-D-mannopyranosyl(1 → 4), α-L-2,6-diamino-2,6-dideoxy-idopyranosyl(1 → 3), β-D-ribofuranosyl(1 → 5), O-[α-D-2-amino-2,3-dideoxy-glucopyranosyl(1 4)] 1,3-diamino-1,2,3-trideoxy-myoinositol, corresponding to the structural formula



and the empirical formula $C_{29}H_{53}N_3O_{18}$, an Rf-value of 0.50, the pentahydrochloride of which has a specific optical rotation $[\alpha]_D^{22}$ of + 50° and a decomposition point of 185° to 195°C and showing the infrared spectrum as in FIG. 2 and a compound expressed by the chemical name O-α-L-2,6-diamino-2,6-dideoxy-idopyranosyl (1 → 3), β-D-ribofuranosyl(1 → 5), O-[α-D-2-amino-2,3-dideoxy-glucopyranosyl(1 → 4)] 1,3-diamino-1,2,3-trideoxy-myoinositol, corresponding to the structural formula



and the empirical formula $C_{23}H_{45}N_3O_{13}$, an Rf-value of 0.75, the pentahydrochloride of which has a specific optical rotation $[\alpha]_D^{22}$ of + 36° and a decomposition point of 198° to 208°C and showing the infrared spectrum as in FIG. 3.

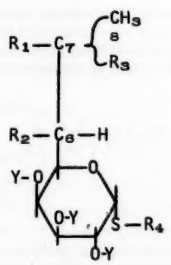
3,870,699

LINCOMYCIN ANALOGS

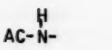
Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 6, 1973, Ser. No. 338,459
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R **21 Claims**

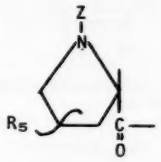
1. A compound of the formula:



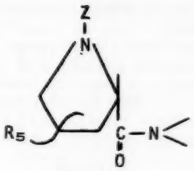
wherein R_1 when taken independently represents hydrogen; R_2 when takene independently represents the monovalent moiety



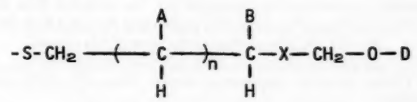
wherein Ac is selected from carboxyacyl of from 2 to 18 carbon atoms, inclusive, and an acyl radical of formula:



wherein Z is selected from hydrogen, lower alkyl and an amino protecting group removable by hydrogenolysis; R_5 is lower alkyl; R_1 and R_2 when taken together form the divalent group of the formula:



wherein Z and R_5 are as defined above; R_3 is hydrogen when R_1 and R_2 are taken together and when R_1 and R_2 are taken independently, R_3 is a monovalent thio group in the 7(S)-position, having the formula:



wherein A is selected from hydrogen and hydroxy, B is selected from hydrogen and monohydroxyloweralkyl, *n* is the integer 0 when B is monohydroxyloweralkyl and an integer of from 0 to 1 when B is hydrogen, X is selected from oxygen and sulfur, D is an acyl radical of a lower hydrocarbon carboxylic acid; R_4 represents lower alkyl; and Y is selected from carboxacyl of from 2 to 18 carbon atoms, inclusive, and hydrogen.

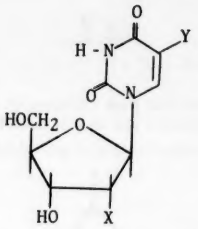
3,870,700

2-HALOGENO-2-DEOXY-5-(SUBSTITUTED)URIDINES

Michael Paul Kotick, and Joseph Odo Polazzi, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 29, 1973, Ser. No. 364,700
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **4 Claims**

1. A compound having the formula



wherein:

X is selected from substituents consisting of fluoro, chloro, and bromo; and,

Y is thiocyanato.

3,870,701

BENZYL HYDROXYPROPYL CELLULOSE ACETATE AND PROCESS

James Teng, St. Louis County, and Marcella C. Stubits, St. Louis, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,238

Int. Cl. C08b *13/00, 21/34*

U.S. Cl. 260—226 **12 Claims**

1. The compound benzyl hydroxypropyl cellulose acetate having a degree of molar substitution of about 2 to about 6 hydroxypropyl groups, a degree of substitution of benzyl groups of about 0.1 to about 0.8 and a degree of substitution of acetyl groups of about 1.0 to about 2.5 and further characterized by being soluble in organic solvents.

3,870,702

CELLULOSE ETHER COMPOSITIONS USEFUL AS ENTERIC COATINGS

Shunichi Koyanagi; Kinya Ogawa; Yoshiro Onda, and Akira Yamamoto, all of Naoetsu, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Continuation of Ser. No. 171,005, Aug. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 118,555, Feb. 24, 1971, Pat. No. 3,712,886. This application Nov. 9, 1973, Ser. No. 414,186. The portion of the term of this patent subsequent to Jan. 23, 1990, has been disclaimed.

Claims priority, application Japan, Mar. 19, 1971, 46-15953

Int. Cl. C08b *11/00*

U.S. Cl. 260—226 **19 Claims**

1. A coating composition consisting essentially of a solution of an organic solvent and at least one monoester selected from the group consisting of a tetrahydrophthalic acid monoester and hexahydrophthalic acid monoester of a cellulose ether represented by the general formula

$$R^1{}_mR^2{}_nA$$

wherein R^1 is a hydroxyl alkyl radical having three to four carbon atoms, R^2 is selected from the group consisting of hydrogen and alkyl radicals of one to two carbon atoms, m and n are positive integers, and A is a cellulose residue.

3,870,703

PRODUCTION OF CELLULOSE ESTERS

Kelly B. Gibney, Burnaby; John Howard, and Russell S. E· ans, both of Vancouver, British Columbia, all of Canada, assignors to Canadian Cellulose Company, Limited. Vancouver, British Columbia, Canada

Filed June 21, 1973, Ser. No. 372,147

Int. Cl. C08b *3/06, 3/10*

U.S. Cl. 260—229 **6 Claims**

1. In the production of a solution of a cellulose lower alkanoate suitable for use in the formation of fibers wherein a cellulose source is subjected to the esterification with a lower alkanoic acid anhydride in a lower alkanoic acid thereby forming said cellulose lower alkanoate dissolved in said acid, the improvement which comprises employing as said cellulose source, cellulose having a hemicellulose content in excess of about 5% by weight, and prior to esterification with said lower alkanoate acid anhydride, reacting said cellulose with an anhydride esterifying agent different from the lower alkanoate ester ultimately desired for a period of from 5 to 30 minutes, said agent being employed in more than the stoichiometric amount required for reaction with the hemicellulose, whereby said hemicellulose is preferentially esterified and whereby the solution of cellulose lower alkanoate ultimately produced is characterized by a performance during subsequent processing comparable to that of initially more pure cellulose sources.

3,870,704

NITROGEN CONTAINING AMYLOSE DERIVATIVES

Mikihiko Yoshida, and Shokichi Yuen, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Continuation of Ser. No. 112,405, Feb. 3, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 311,777

Claims priority, application Japan, Feb. 3, 1970, 45-9428

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **2 Claims**

1. Amylose-O-CO-NH_2, wherein said amylose has a DP of 15–50.

3,870,705

6-ISOCYANATOAMINOPENICILLANIC ACID DERIVATIVES AND PROCESS FOR PRODUCING THEM

Peter Wolfgang Henniger, Leiden, and Peter Max Smid, Delft, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-En Spiritusfabried N.V., Delft, Netherlands

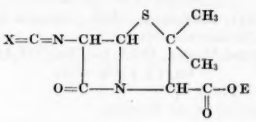
Continuation-in-part of Ser. No. 98,445, Dec. 15, 1970, Pat. No. 3,741,958, which is a continuation-in-part of Ser. Nos. 834,544, June 18, 1969, abandoned, and Ser. No. 98,462, Dec. 15, 1970, abandoned. This application Jan. 25, 1972, Ser. No. 220,713

Claims priority, application Great Britain, Dec. 18, 1969, 61840/69

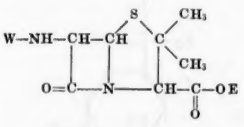
Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **14 Claims**

1. A process for the preparation of 6-isocyanatopenicillanic acid compounds of claim **18** having the formula



wherein X is oxygen and E is selected from the group consisting of a silyl, optionally halo-substituted phenacyl, benzyl and benzhydryl consisting essentially of reacting phosgene with a penicillanic acid derivative of the formula



wherein W is selected from the group consisting of hydrogen and $(R)_3Si$— where R is selected from the group consisting of lower alkyl, phenyl and phenyl lower alkyl and E is as defined above in an inert organic medium to convert the group W-NH- into an isocyanato group without affecting the rest of the molecule.

3,870,706

6H-S-TRIAZOLO[4.3-a][1.4]BENZODIAZEPIN-6-ONES

Hans Allgeier, Haagen, Germany, and Andre Gagneux, Basle, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

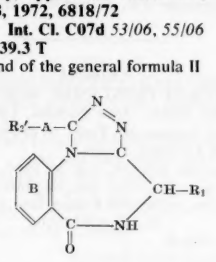
Filed Feb. 23, 1973, Ser. No. 335,268

Claims priority, application Switzerland, Feb. 29, 1972, 2917/72; May 8, 1972, 6818/72

Int. Cl. C07d *53/06, 55/06*

U.S. Cl. 260—239.3 T 8 Claims

1. A compound of the general formula II



(II)

wherein

R_1 represents hydrogen, or an alkyl group having 1 to 3 carbon atoms,

A represents an alkylene group having 1 to 3 carbon atoms, R_2' represents alkoxy having 1 to 6 carbon atoms, benzyloxy, chlorobenzyloxy, methyl-benzyloxy, methoxybenzyloxy, trimethoxy-benzyloxy, diphenylmethoxy, dialkylamino, wherein the alkyl groups contain 1 to 6 carbon atoms, N-alkylaralkylamino, wherein the alkyl group contains 1 to 6 carbon atoms and the aralkyl group is a phenyl-substituted alkyl group wherein the alkyl group has 1 to 3 carbon atoms, diaralkylamino wherein the aralkyl groups are phenyl-substituted alkyl groups wherein the alkyl group has 1 to 3 carbon atoms, polymethyleneimino having 5 to 7 ring members or morpholino, and said polymethyleneimino and morpholino members substituted by lower alkyl and which contain including these at most 10 carbon atoms, or

R_2'-A together represent dialkoxymethyl of which the alkoxy radicals have 1 to 4 carbon atoms, or alkylenedioxymethyl having in all 3 to 6 carbon atoms, and

the ring B is unsubstituted or substituted by halogen up to atomic number 35, alkyl or alkoxy each having 1 to 6 carbon atoms, or a trifluoromethyl group.

3,870,707

PROCESS FOR THE MANUFACTURE OF N,N-DISUBSTITUTED CARBAMIC ACID HALIDES

Tibor Somlo, Birsfelden, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

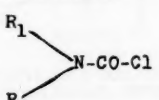
Filed Feb. 14, 1972, Ser. No. 226,320

Claims priority, application Switzerland, Feb. 16, 1971, 2246/71

Int. Cl. C07d *23/06*

U.S. Cl. 260—239 E 5 Claims

1. A process for the manufacture of N,N-disubstituted carbamic acid chlorides of the formula



in which R_1 and R_2 each represent alkyl of 1 to 18 carbon atoms or benzyl, or R_1 and R_2 taken together with the nitrogen atom represent aziridino, pyrrolidino, piperidino, hexamethyleneimino or morpholino, consisting of the step of treating a secondary amine of the formula R_1R_2NH with phosgene, at a temperature in the range of 60 to 160°C, wherein the solvent is the N,N-disubstituted carbamic acid chloride being manufactured.

3,870,708

AMINE DERIVATIVES OF PENICILLINS AND THE METHOD OF THEIR PRODUCTION

Wojciech Gruszecki, Gdansk; Emil Taszer, and Edward Borowski, both of Gdansk-Wrzeszcz, all of Poland, assignors to Politechnika Gdanska Instytut Chemii i Technologii Organicznej Oraz Zywnosciowej, Gdansk-Wrzeszcz, Poland

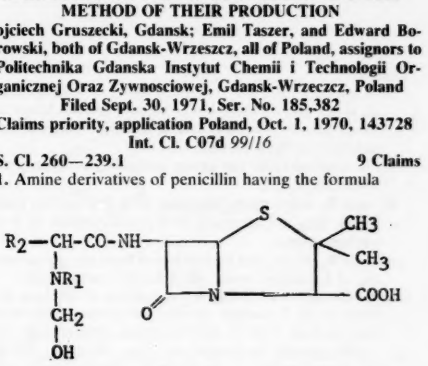
Filed Sept. 30, 1971, Ser. No. 185,382

Claims priority, application Poland, Oct. 1, 1970, 143728

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 9 Claims

1. Amine derivatives of penicillin having the formula



wherein R_1 is selected from the group consisting of benzyloxycarbonyl and p-nitrobenzyloxycarbonyl and R_2 is selected from the group consisting of phenyl, p-hydroxyphenyl, p-methoxyphenyl, propionyl and phenyl propionyl.

3,870,709

6-(ALPHA-(OME GA-GUANIDINOALKANOYLAMIDO)ACYLAMIDO)-PENICILLANIC ACIDS

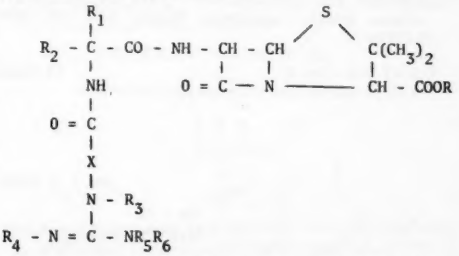
Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,344

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 13 Claims

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein R is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 14 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, naphthyl, benzyl, phenethyl, furyl, thienyl, and

wherein

Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl)amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_1 and R_2 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

each of R_3, R_4, R_5 and R_6 is selected from the group consisting of hydrogen, lower alkyl, benzyl and phenyl;

X is selected from the group consisting of alkylene having from 1 to 7 carbon atoms, phenylene, cycloalkylene having from 3 to 9 carbon atoms, propenylene whose $-CH_2$ group is bound to the adjacent nitrogen; vinylenephenylene, methylene oxyphenylene and phenylenemethylene, each of whose phenylene group is bound to the adjacent nitrogen;

X and $N-R_3$ when taken together form a 5- or 6-membered heterocyclic ring selected from the group consisting of pyrrolidyl and piperidyl;

X and R_5 when taken together with the guanidino moiety to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of 2-amino-2-imidazolinyl and 2-amino-2-(1,4,5,6-tetrahydropyrimidinyl);

R_3 and R_4 when taken together with the guanidino moiety to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of 2-imidazolino and 2-(1,4,5,6-tetrahydropyrimidino); and R_3 and R_5 when taken together with the guanidino moiety to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of imidazolidino and hexahydropyrimidino.

3,870,710

CYCLOPENTANONE DERIVATIVES

Jacques Martel, Bondy; Edmond Toromanoff, Paris, and Jean Buendia, Fontenay-Sous-Bois, all of France, assignors to Roussel-Uclaf, Paris, France

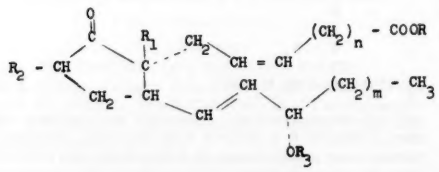
Division of Ser. No. 138,276, April 28, 1971, Pat. No. 3,801,623. This application Feb. 7, 1973, Ser. No. 330,411

Claims priority, application France, Apr. 30, 1970, 70.15910

Int. Cl. C07c *69/74*; **C07d** *7/04*

U.S. Cl. 260—240 R **12 Claims**

1. A prostanoic acid compound of the formula



wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 7 carbon atoms, R_1 is selected from the group consisting of hydrogen and carbalkoxy of 1 to 7 alkyl carbon atoms, R_2 is selected from the group consisting of hydrogen, carboxy and carbalkoxy of 1 to 7 alkyl carbon atoms, R_3 is selected from the group consisting of hydrogen and α-tetrahydropyranyl, *m* is 3, 4 or 5 and *n* is 2, 3 or 4 with the proviso that when R_1 is carbalkoxy, R is alkyl of 1 to 7 carbon atoms, R_2 is hydrogen and R_3 is α-tetrahydro-pyranyl; when R_2 is carbalkoxy, R is alkyl of 1 to 7 carbon atoms, R_1 is hydrogen and R_3 is α-tetrahydropyranyl and when R_2 is carboxy, R and R_1 are hydrogen and R_3 is α-tetrahydropyranyl and when R is hydrogen, at least one of R_1, R_2 and R_3 is other than hydrogen.

3,870,711

PREPARATION OF PROSTANOIC ACID DERIVATIVES

Jacques Martel, Bondy; Jean Buendia, Fontenay-Sous-Bois, and Edmond Toromanoff, Paris, all of France, assignors to Roussel-UCLAF, Paris, France

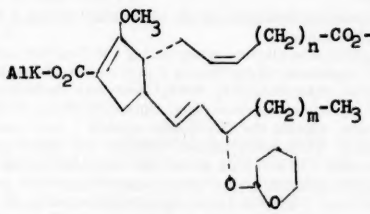
Division of Ser. No. 176,234, Aug. 30, 1971,. This application Sept. 26, 1973, Ser. No. 400,709

Claims priority, application France, Sept. 4, 1970, 7032255

Int. Cl. C07d *7/02*

U.S. Cl. 260—240 R **15 Claims**

1. A compound of the formula



wherein AlK and AlK′ are lower alkyl, *n* is 2, 3 or 4 and *m* is 3, 4 or 5.

3,870,712

CINCHONINIC ACID DERIVATIVES

Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

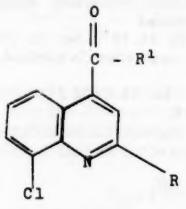
Division of Ser. No. 235,850, March 17, 1972, Pat. No. 3,799,929. This application Nov. 8, 1973, Ser. No. 414,005

Int. Cl. C07d *33/14*

U.S. Cl. 260—240 A **4 Claims**

1. The compounds of the formula:

[I]



wherein R represents:

a. 2-indolyl,

b. 1-methyl-2-indolyl,

c. 3-indolyl,

d. 1-methyl-3-indolyl,

e. 2-phenoxathiinyl,

f. 2-furyl,

g. (2-furyl)vinyl,

h. (5-nitro-2-furyl)vinyl,

i. 2-thienyl, or

j. 5-nitro-2-thienyl; and

R^1 represents:

a. OH or

b. loweralkoxy of 1 to 3 carbon atoms,

and the pharmaceutically-acceptable, alkali-metal and alkaline-earth-metal salts derived from those compounds of Formula I wherein R^1 is OH.

3,870,713

PHOSPHONO SUBSTITUTED ALKYLCEPHALOSPORINS

Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

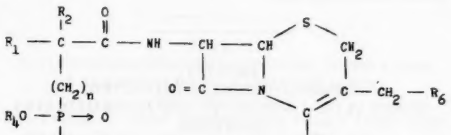
The portion of the term of this patent subsequent to Aug. 6, 1974, has been disclaimed.

Filed Dec. 7, 1970, Ser. No. 95,918

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **12 Claims**

1. A compound of the formula



and the non-toxic cationic salts thereof wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl and substituted phenyl wherein the substituent is selected from the group consisting of lower alkyl, lower alkoxy, chloro, bromo, fluoro and trifluoromethyl; R_2 is hydrogen;

R_1 and R_2 when taken together with the carbon atom to which they are attached are selected from the group consisting of cycloalkyl of from four to six carbon atoms; R_3 is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein the acyloxy moiety is selected from the group consisting of lower alkanoyloxy, and benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy trifluoromethyl;

each of R_4 and R_5 is selected from the group consisting of hydrogen, lower alkyl, substituted lower alkyl wherein the substituent is selected from the group consisting of lower alkoxy and fluoro; phenyl and substituted phenyl wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkoxy, lower alkyl annd trifluoromethyl;

R_6 is selected from the group consisting of hydrogen, hydroxy, acetoxy and pyridine; and

n is 0 or an integer from 1 to 4.

3,870,714

CERTAIN 6-PHENYL-4H-S-TRIAZOLO[1,5-a][1,4]BENZODIAZEPINE-2-CARBOXAMIDES

Andre Gagneux, Basel; Roland Heckendorn, Arlesheim, Basel-Land, and Rene Meier, Buus, Basel-Land, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

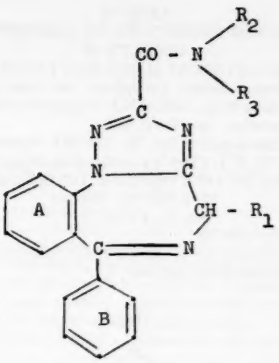
Filed Jan. 31, 1973, Ser. No. 328,815

Claims priority, application Switzerland, Feb. 7, 1972, 1738/72; Aug. 31, 1972, 12843/72; Nov. 3, 1972, 16045/72

Int. Cl. C07d *57/02, 57/04, 99/02*

U.S. Cl. 260—247.5 EP **31 Claims**

1. A diazepine derivative having the formula



wherein

R_1 represents hydrogen, or an alkyl group having 1 to 3 carbon atoms, and

R_2 and R_3 independently of each other, represent hydrogen, alkyl groups having 1 to 6 carbon atoms, or hydroxyalkyl groups having in all 4 to 7 carbon atoms, or aralkyl groups having 7 to 9 carbon atoms, or together with the adjacent nitrogen atom, the 1-pyrrolidinyl-, piperidino-, 4-methyl-1-piperazinyl, or morpholino group;

wherein each of the rings A and B independently of the other, is unsubstituted or substituted by one member of the group consisting of halogen up to atomic number 35, trifluoromethyl or nitro groups,

its 5-oxide and its pharmaceutically acceptable acid addition salts.

3,870,715

SUBSTITUTED AMINO ETHYL META BENZOIC ACID ESTERS

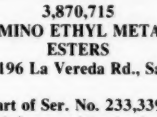
Nikolaus R. Hansl, 196 La Vereda Rd., Santa Barbara, Calif. 93108

Continuation-in-part of Ser. No. 233,339, March 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 745,352, July 17, 1968, and a continuation-in-part of Ser. No. 85,283, Oct. 29, 1970, Pat. No. 3,792,048. This application Apr. 2, 1973, Ser. No. 347,287

Int. Cl. C07d *87/36*

U.S. Cl. 260—247.2 B **19 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, hydroxy, lower alkoxy or lower alkyl; R_2 is hydrogen or lower alkyl; R_3 is lower alkyl, aralkyl or lower alkyl aryl; R_4 taken independently is hydrogen, lower alkyl, aralkyl, lower alkyl aryl, hydroxy lower alkyl and lower alkoxy lower alkyl; R_5 taken independently is lower alkyl, aralkyl, lower alkyl aryl or lower alkoxy lower alkyl; and R_4 and R_5 taken together with the adjacent nitrogen atom form a saturated five or six membered heterocyclic ring which may contain one additional hetero atom selected from the group consisting of —O— and —NR_6— where R_6 is hydrogen or lower alkyl

and the optical antipodes and the pharmaceutically acceptable acid addition salts thereof.

3,870,716
PROCESS FOR PRODUCTION OF ALKYLENE OXIDE ADDUCTS OF IRIS(2-HYDROXYALKYL)ISOCYANURATE

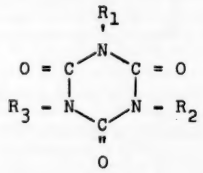
Stephen Edward Belsky, Parsippany, and John Henry Bonfield, Basking Ridge, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 126,884, March 22, 1971, Pat. No. 3,726,871, which is a continuation-in-part of Ser. No. 39,855, May 20, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 294,062

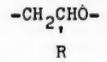
Int. Cl. C07d *55/38*

U.S. Cl. 260—248 NS **11 Claims**

1. In the process for preparing hydroxyalkylated isocyanurate compounds of the formula:



wherein R_1 is a hydrogen-terminated oxyalkylene chain of from 2 to 30 oxyalkylene units, and R_2 and R_3 are each a hydrogen-terminated oxyalkylene chain of from 1 to 30 oxyalkylene units, wherein each oxyalkylene unit has the formula



wherein R is hydrogen, methyl or ethyl, by reacting in a reaction vessel tris(2-hydroxyalkyl)isocyanurate wherein said hydroxyalkyl group contains of from 2 to 4 carbon atoms with at least an equimolar amount of an alkylene oxide of the formula:

wherein R has the meaning given above, in the presence of an acid catalyst at a temperature of about 80°C to 165°C, the improvement which comprises effecting said reaction in the presence of a hydroxyalkylated isocyanurate compound of the above formula.

3,870,717
NEW VAT DYESTUFFS, THEIR MANUFACTURE AND USE

Paul Ulrich, and Max Stauble, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

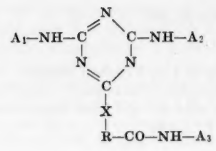
Filed Feb. 28, 1973, Ser. No. 336,574

Claims priority, application Switzerland, Mar. 3, 1972, 3133/72; Jan. 22, 1973, 855/73

Int. Cl. C07d *55/20*

U.S. Cl. 260—249 **4 Claims**

1. A vat dyestuff of the formula



in which A_1 and A_2 are independently anthraquinone, phthaloylacridone or thiazoleanthrone, optionally substituted by methoxy, chloro and benzoylamino, X is —O— or —S—, R is benzene, naphthalene or anthracene, optionally substituted by chloro, hydroxy, methyl, chlorobenzoylamino, dichlorobenzoylamino and anthraquinonylcarbonylamino, and A_3 is anthraquinone, phthaloylacridone, thiazoleanthrone or anthrapyrimidine, optionally substituted by chloro, phenylamino, phenylthio, benzoylamino, chlorobenzoylamino and hydroxybenzoylamino, and in which the radical R is bound in ortho- or meta-position.

3,870,718
2-IMIDAZOLIDINE SUBSTITUTED QUINOXALINE-1,4-DIOXIDES AND INTERMEDIATES THEREFOR

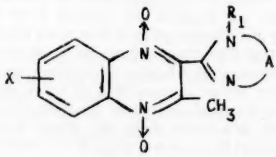
Marwan J. Abu El-Haj, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 207,534, Dec. 13, 1971, abandoned, which is a division of Ser. No. 20,842, March 18, 1970, Pat. No. 3,671,521. This application Oct. 10, 1973, Ser. No. 405,114

Int. Cl. C07d *51/78*

U.S. Cl. 260—250 Q **7 Claims**

1. A compound having the formula



wherein X is selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and trifluoromethyl; R_1 is selected from the group consisting of hydrogen and alkyl having one to four carbon atoms;

A is alkylene of from two to five carbon atoms which places at least two carbon atoms between the N atoms to which it is attached;

and the non-toxic acid addition salts thereof.

3,870,719
SYNTHESIS OF N-5-METHYLTETRAHYDROHOMOFOLIC ACID AND RELATED REDUCED DERIVATIVES OF HOMOFOLIC ACID

Roger L. Knott, and Alison Taunton-Rigby, both of Waltham, Mass., assignors to The United States of America as represented by the Secretary of the Department of Health Education and Welfare, Washington, D.C.

Filed June 16, 1972, Ser. No. 263,559

Int. Cl. C07d *51/48*

U.S. Cl. 260—251.5 **2 Claims**

1. 5-methyltetrahydrohomofolic acid and alkali metal salts thereof.

3,870,720
POTASSIUM DERIVATIVES OF 2-PHENYL-6-SULPHAMYL-7-CHLORO-1,2,3,4-TETRAHYDRO-4-QUINAZOLINONE

Massimo Carissimi, 3, Via Cesare Cantu, and Franco Ravenna, 57/a Via Vincenzo Monti, both of Milan, Italy

Filed May 2, 1973, Ser. No. 356,403
Claims priority, application Italy, May 5, 1972, 23925/72
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.5 R **2 Claims**

1. As a novel, nontoxic, nonmercurial diuretic compound, the derivative of 2-phenyl-6-sulphamyl-7-chloro-1,2,3,4-tetrahydro-4-quinazolinone, wherein either hydrogen of the sulphamyl group of the starting quinazolinone is replaced by a potassium atom.

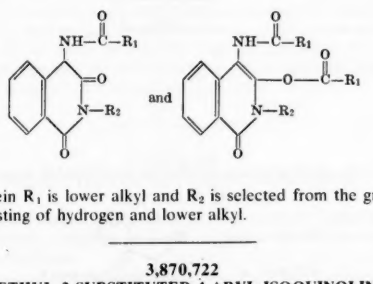
2. As a novel, nontoxic, nonmercurial diuretic compound, the derivative of 2-phenyl-6-sulphamyl-7-chloro-1,2,3,4-tetrahydro-4-quinazolinone, wherein either hydrogen of the sulphamyl group of the starting quinazolinone and the hydrogen in the 3-position of the tetrahydroqinazoline ring of same starting quinazolinone are replaced by a potassium atom each.

3,870,721
4-ALKANOYLAMINO ISOQUINOLINE DIONES AND 3-ALKANOYLOXY-4-ALKANOYLAMINO ISOQUINOLONES

John Leheup Archibald, Windsor; John Terence Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Taplow, Maidenhead, Berkshire, England

Filed Nov. 21, 1973, Ser. No. 417,867
Claims priority, application Great Britain, Nov. 30, 1972, 55252/72
Int. Cl. C07d *35/30*
U.S. Cl. 260—281 **4 Claims**

1. A compound selected from those of the formula



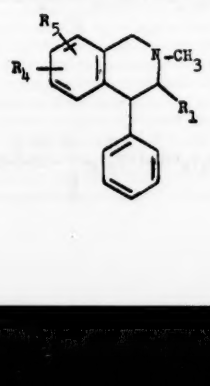
wherein R_1 is lower alkyl and R_2 is selected from the group consisting of hydrogen and lower alkyl.

3,870,722
2-METHYL-3-SUBSTITUTED-4-ARYL ISOQUINOLINES

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Nov. 2, 1973, Ser. No. 412,132
Int. Cl. C07d *33/34*
U.S. Cl. 260—283 R **5 Claims**

1. A compound of the formula



where R_1 represents

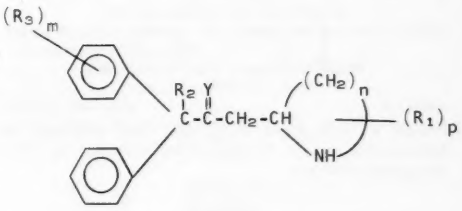
where R_2 and R_3 are each, independently, methyl or ethyl, or R_2 and R_3 together represent $(CH_2)_n$
where n represents 4, 5, or 6,
and R_4, and R_5 each, independently, represent hydrogen, halo of atomic weight 19–36, trifluoromethyl, lower alkyl, or lower alkoxy, provided that R_4 and R_5 may not represent alkyl at the 8-position, and provided further that two trifluoromethyl or two tertiary butyl groups or a trifluoromethyl and a tertiary butyl group are not on adjacent carbon atoms
and the pharmacologicaliy acceptable acid addition salts thereof.

3,870,723
2-AZACYCLOALKYLMETHYL SUBSTITUTED BENZHYDRYL KETONES AND CARBINOLS

J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,315
Int. Cl. C07d *29/20*
U.S. Cl. 260—293.8 **5 Claims**

1. A 2-azacycloaklylmethyl substituted benzhydryl ketone and carbinol having the formula:



wherein m is an integer of from 1 to 3; n is an integer of from 3 to 5; p is an integer of from 1 to 2; R_1 is selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms; R_2 is selected from the group consisting of hydrogen and lower alkyl having from 1 to 4 carbon atoms; R_3 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, lower alkoxy having from 1 to 4 carbon atoms, lower alkylthio having from 1 to 4 carbon atoms and halogen; Y is the radical =O or

or a pharmaceutically acceptable acid addition salt thereof.

3,870,724
PROCESS FOR PREPARING PYRIDOXAL-5'-MONOPHOSPHATE

Hitoshi Uno, Takatsuki-shi, and Akira Irie, Hirakata-shi, both of Japan, assignors to Dainippon Pharmaceutical Co. Ltd., Osaka, Japan

Filed Mar. 7, 1969, Ser. No. 805,345
Claims priority, application Japan, Mar. 12, 1968, 43-16124; Mar. 13, 1968, 43-16381
Int. Cl. C07d *31/32*
U.S. Cl. 260—297 V **10 Claims**

1. A process for preparing pyridoxal -5- mono phosphate which comprises the steps of reacting a pyridoxal hydrochlo-

ride or pyridoxal hydroxy sulfonic acid with a metal salt selected from the chlorides and sulfates of nickel, cobalt and iron and an amine selected from the group consisting of lower alkyl amines, cyclo (5-6 carbon alkylamines,) phenyl lower alkylamines and anilines, in water, a water miscible lower alkanol or a mixture of water and said lower alkanol to produce a reaction mixture, adjusting the pH of the reaction mixture to about 7 to 10 to precipitate from the reaction mixture a pyridoxal Schiff's base metal chelate, separating the precipitated Schiff's base metal chelate from the reaction mixture, reacting the separated precipitated pyridoxal Schiff's base metal chelate with a phosphorylating agent selected from the group consisting of a mixture of phosphoric acid and phosphoric acid anhydride, a mixture of phosphoric anhydride and water, meta phosphoric acid, a mixture of phosphorous oxychloride and water and tetrachloro pyro phosphoric acid to produce a phosphorylated Schiff's base metal chelate and heating the phosphorylated Schiff's base metal chelate with water to hydrolyze it and produce said pyridoxal-5-mono phosphate.

3,870,725

NITROTHIAZOLE DERIVATIVES

Peter Graham Hughes, Sunningdale, and John Pomfret Verge, Middle Assendon, both of England, assignors to Lilly Industries Limited, London, England

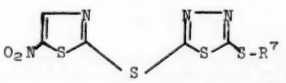
Filed Mar. 13, 1972, Ser. No. 234,376

Claims priority, application Great Britain, Mar. 30, 1971, 8252/71; Aug. 20, 1971, 39106/71

Int. Cl. C07d *99/10*

U.S. Cl. 260—302 H **4 Claims**

1. Compound having the formula



wherein R^7 is hydrogen, C_{1-10} alkyl, allyl, propargyl, β-hydroxyethyl, benzyl, N,N-dimethylthiocarbamyl or N,N-diethylthiocarbamyl.

3,870,726

DERIVATIVES OF 3-AZOLYLPROPYNE AND PROCESSES FOR THEIR PREPARATION AND USE

Gerhard Jager; Manfred Plempel, and Karl Heinz Buchel, all of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

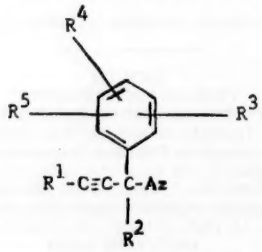
Continuation of Ser. No. 177,843, Sept. 3, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,581

Claims priority, application Germany, Sept. 9, 1970, 2044621

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **24 Claims**

1. A compound selected from the group consisting of a 3-azolylpropyne derivative of the formula:



wherein

R^1 is hydrogen, chloro, bromo, iodo or lower alkyl;

R^2 is lower alkyl or phenyl;

R_3, R_4 and R_5 are the same or different and selected from hydrogen, halogeno, trifluoromethyl, nitro, lower alkyl or lower alkoxy but are not all identical; and

Az is imidazole linked to the adjacent carbon atom in the 1-position; or

a physiologically acceptable acid addition salt thereof.

3,870,727

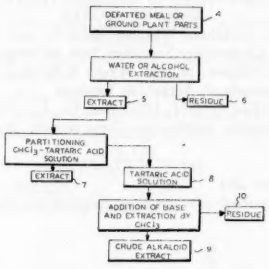
PRODUCTION OF HARRINGTONINE AND ISOHARRINGTONINE

Richard G. Powell, Peoria, and Cecil R. Smith, Jr., Dunlap, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

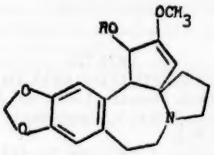
Continuation-in-part of Ser. No. 26,995, April 9, 1970, abandoned. This application Apr. 27, 1972, Ser. No. 248,189

Int. Cl. C07d *27/04*

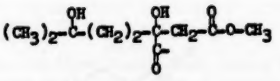
U.S. Cl. 260—326.5 **3 Claims**



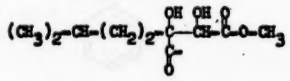
1. The alkaloid compound having the following structure:



where R equals



or



3,870,728

DERIVATIVES OF 4'-AMINOMETHYL-DIBENZO (B,E)-11-OXEPINE-2'-SPIRO-1',3'-DIOXOLANE, THEIR METHOD OF PREPARATION AND THEIR THERAPEUTIC APPLICATION

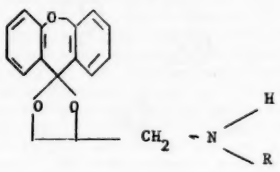
Claude P. Fauran, Paris; Jeannine A. Eberle, Chatou; Albert Y. Le Cloarec, Saint-Maur; Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon la Foret, all of France, assignors to Delalande S.A., Courbevoie (Hauts de Seine), France

Filed Jan. 29, 1973, Ser. No. 327,810

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **5 Claims**

1. A compound having the formula



(I)

in which R is alkyl having 1 to 4 carbon atoms.

3,870,729

PROCESS FOR THE EPOXIDATION OF OLEFINES

Pierre-Etienne Bost, Paris; Michel Costantini, Lyon, and Guy Lartigau, Tassin-La-Demi Lune, Rhone, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Jan. 31, 1974, Ser. No. 438,461

Claims priority, application France, Feb. 2, 1973, 73.03729

Int. Cl. C07d *1/08*

U.S. Cl. 260—348.5 L **15 Claims**

1. In a process for the epoxidation of an olefinic compound by contacting the said compound with an organic hydroperoxide in the presence of a soluble titanium compound, the improvement which consists in carrying out the said epoxidation in the presence of a phosphoric acid ester.

3,870,730

PRODUCTION OF ANTHRAQUINONE FROM NAPHTHALENE

Gerhard Scharfe, and Johann Grolig, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 12, 1973, Ser. No. 350,570

Claims priority, application Germany, Apr. 15, 1972, 2218316; Sept. 16, 1972, 2245555

Int. Cl. C09b *1/00*

U.S. Cl. 260—369 **12 Claims**

1. In the production of anthraquinone wherein naphthalene is oxidized to form naphthoquinone and phthalic anhydride, the naphthoquinone is reacted with butadiene to form tetrahydroanthraquinone, and the tetrahydroanthraquinone is reacted with oxygen to form anthraquinone, the improvement which comprises effecting the reaction of naphthoquinone with butadiene at a temperature of about 80 to 250°C in the presence of about 20 to 90% by weight of naphthalene based on the weight of naphthalene, naphthoquinone and phthalic anhydride, to produce a reaction mixture comprising naphthalene, tetrahydroanthraquinone and phthalic anhydride, separating the naphthalene from said reaction mixture, reacting the remaining mixture comprising tetrahydroanthraquinone and about 50 to 90% by weight of phthalic anhydride at a temperature of about 150 to 300°C with molecular oxygen, and removing phthalic anhydride from an oxidation reaction mixture comprising anthraquinone and phthalic anhydride.

3,870,731

OXIDATION OF PHENOLS AND ALKYL SUBSTITUTED PHENOLS TO THEIR CORRESPONDING PARA-BENZOQUINONE

David A. Hutchings, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 28, 1973, Ser. No. 401,724

Int. Cl. C07c *49/64*

U.S. Cl. 260—396 R **11 Claims**

1. A process comprising reacting a solution of phenol in a solvent with oxygen in the presence of at least one copper containing material, as catalyst, said catalyst being selected from the group consisting of copper (I) ions, copper (II) ions and metallic copper and a promoter selected from the group consisting of chloro, bromo, iodo, thiocyanate, cyanate and cyanide ions and wherein the reaction is carried out at an oxygen partial pressure up to 750 psig and at a temperature of 30° to 150°C. in the presence of from 0.01 mole of catalyst per mole of phenol to 5.0 moles of catalyst per mole of phenol said solvent being selected from the group consisting of:

A. water,

B. N-alkyl substituted amides selected from the group consisting of dimethylformamide, diphenylformamide, N-methyl-2-pyrrolidone, cyclohexylmethylformamide, and phenylmethylformamide,

C. alcohols selected from the group consisting of methanol, ethanol and isopropanol and

D. sulfoxides selected from the group consisting of dimethylsulfoxide, cyclohexylmethylsulfoxide and phenylmethylsulfoxide.

3,870,732

MIXED SALTS OF ALUMINUM

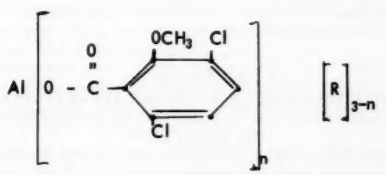
Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 21, 1973, Ser. No. 390,286

Int. Cl. C09f *5/00, 7/00*

U.S. Cl. 260—408 **8 Claims**

1. A mixed salt of aluminum having the empirical formula



wherein R is an organic acid radical of from 7 to 20 carbon atoms and n has an average value of from 0.5 to 2.5 .

3,870,733

MIXTURES OF GLYCERIDES HAVING CYTO-C22 FATTY ACID CONTENT

Hayato Kubota, Kobe; Sadao Nakayama, Hirakata, and Teizaburo Tateishi, Toyonaka, all of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

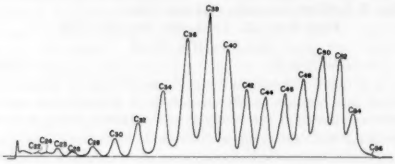
Continuation-in-part of Ser. No. 4,111, Jan. 20, 1970, abandoned, and a continuation-in-part of Ser. No. 5,906, Jan. 26, 1970, abandoned, and a continuation-in-part of Ser. No. 53,146, July 2, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,153

Int. Cl. C11c *3/10;* **A23d** *3/00, 3/02*

U.S. Cl. 260—410.8 **3 Claims**

1. An oil or fat composition exhibiting a buttery flavor consisting essentially of a mixture of glycerides having carbon numbers from 22 to 54, the total content of C_{36} and C_{38} glycerides being up to 25 wt percent, and the contents of C_{22}, C_{24} and C_{26} glycerides being from 0.2 to 3.8 wt percent, from 0.2 to 15.0 wt percent and from 0.4 to 25.0 wt percent, respec-

tively, based on the weight of said composition and said glycerides having a C_4 to C_{22} fatty acid content, the content of at least one of the C_4 and C_6 fatty acids being from 1 to 25 wt percent, the content of C_8 fatty acid being 0.5 to 10 wt percent, the content of C_{10} fatty acids being 0.5 to 10 wt percent and the content of C_{12} fatty acid being from 0.5 to 10 wt percent based on a total weight of the fatty acid content in the composition.



3,870,734

PRODUCTION OF MIXTURES OF CARBOXYLIC ACIDS FROM MIXTURES OF OLEFINS

Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 5, 1973, Ser. No. 367,178

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **15 Claims**

1. A process for the production of carboxylic acids from mixtures of olefins having from 24 to 40 carbon atoms, sulfuric acid of at least 92 percent strength, carbon monoxide and water which comprises adding said mixture of olefins dispersed in a hydrocarbon carrier in which less than about 6 grams of said olefin mixture is soluble per 100 grams of said carrier while maintaining the same at a temperature of about 35° to about 150° C. to a reaction zone having a lower temperature than the entering fluid mixture containing carbon monoxide and said sulfuric acid, maintaining the resulting mixture at a temperature of about −15° to about 75° c., adding water to the reaction product so formed and thereafter recovering the desired carboxylic acid product.

3,870,735

CONTINUOUS PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY SUBSTANCES OF DIFFERENT MELTING POINTS

Werner Stein, Erkrath-Unterbach, and Helmut Hartmann, Langenfeld, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

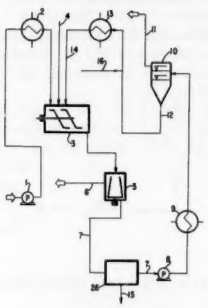
Filed Oct. 26, 1972, Ser. No. 300,895

Claims priority, application Germany, Nov. 11, 1971, 2155988

Int. Cl. C09f *5/10*

U.S. Cl. 260—419 **11 Claims**

1. A continuous process for the separation of mixtures of fatty acids containing from 0.8 percent to 15 percent by weight of non-fatty acid organic impurities into fatty acid mixtures of different melting points by the steps of continuously dispersing said mixture of fatty acids consisting of an oily phase and a solid phase in a recycling aqueous wetting agent solution at a temperature whereby a dispersion of liquid and solid fatty acid particles is obtained, continuously separating said dispersion into two phases of different specific gravities, a lighter phase consisting substantially of liquid fatty acid fractions and a heavier phase consisting substantially of solid fatty acid particles dispersed in said aqueous wetting agent solution, continuously withdrawing said liquid fatty acid fractions, continuously separating said solid fatty acid particles from 10 percent to 70 percent by weight of said aqueous wetting agent solution, continuously withdrawing said separated aqueous wetting agent, solution, continuously melting said solid fatty acid particles containing adhering aqueous phase and wetting agent, in an aqueous phase, continuously separating said melted fatty acid particles containing little wetting agent from an aqueous phase enriched with wetting agent, continuously withdrawing said melted fatty acid particles, continuously recycling said aqueous phase enriched with wetting agent to said dispersing step and continuously replacing said withdrawn part of said recycling aqueous wetting agent solution with a fresh aqueous solution whereby the concentration of said recycling aqueous wetting agent solution is maintained substantially constant at said dispersing step.



3,870,736

METHOD FOR MAKING ORGANOTIN THIOGLYCOLLIC ACID ESTERS

Hans Plum, Heessen, and Friedrich Runggas, Dortmund, both of Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

Filed Jan. 14, 1974, Ser. No. 432,824

Claims priority, application Germany, Jan. 20, 1973, 2302749

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **6 Claims**

1. The method of making an organotin thioglycollic acid ester which comprises reacting a tetraalkyl tin compound with a tin tetrathioglycollic acid ester at a temperature between about 100°C. and about 250°C.

3,870,737

PHOSPHATES

James Derek Birchall, and John Edward Cassidy, both of Runcorn, England, assignors to Imperial Chemical Industries, Limited, London, England

Continuation of Ser. No. 42,499, June 1, 1970. This application July 25, 1972, Ser. No. 274,964

Claims priority, application Great Britain, June 12, 1969, 29862/69

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 R **15 Claims**

1. A method of preparing a complex phosphate of aluminium other than a phosphate ester wherein said complex phosphate contains at least one chemically bound molecule of an alcohol, which comprises interacting an aluminum compound selected from the group consisting essentially of aluminium halides, aluminium oxyhalides, aluminium alkoxyhalides and aluminium alkoxides with an alcohol containing one to ten carbon atoms and phosphoric acid and, when the aluminium compound is an alkoxide, a halogen acid.

3,870,738
PROCESS FOR MANUFACTURING GASES RICH IN METHANE

Kenzo Yamamoto; Seiichi Matsuoka, both of Yokohama, and Toshio Shioda, Yokosuka, all of Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1973, Ser. No. 326,007
Claims priority, application Japan, Jan. 24, 1972, 47-9296
Int. Cl. C07c *1/02, 1/04*
U.S. Cl. 260—449 S **6 Claims**

1. In a process for producing a gas rich in methane wherein a gaseous mixture of feed hydrocarbon containing at least two carbon atoms and steam is subjected to steam reforming in contact with a reforming catalyst at a temperature within the range of 350°C and 550°C and a pressure within the range of 0 kg/cm²G and 100 kg/cm²G to produce an effluent stream of reformed gas mixture comprising as constituent gases methane, water, hydrogen, carbon monoxide and carbon dioxide, and subjecting the said effluent steam of reformed gas to exothermic methanization by passing it through a reaction zone under methanization reaction conditions of a temperature in the range of 2,000°C to 550°C and a pressure in the range of 0 kg/cm²G and 150 kg/cm²G and in contact with methanization catalyst to produce a methane-rich gas, the improvement which comprises:

dividing said effluent stream of reformed gas into two stream parts to constitute a first stream part and a second stream part;

flowing through a first methanization reaction zone containing methanization catalyst and under said methanization reaction conditions, only said first stream part containing all of said constituent gases to obtain a first methanized reaction product gas;

cooling said second stream part to condense the water therein and separating the condensed water from the remainder of said second stream part to obtain a dewatered gaseous second stream part;

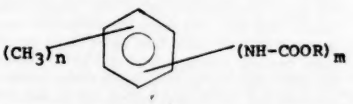
flowing said dewatered gaseous second stream part conjointly with said first methanized reaction product gas through one or more additional methanization reaction zones containing methanization catalyst and under said methanization reaction conditions, said additional methanization reaction zone or zones being separate from said first methanization zone and connected in series with said first methanization zones and all of the methanization reactions being carried out adiabatically, and separating from the last of the methanization reaction zones an effluent gas enriched in methane.

3,870,739
ISOCYANATES FROM URETHANES

George B. DeLaMater, Media; Elbert C. Herrick, West Chester, and Barton Milligan, Ardmore, all of Pa., assignors to Air Products and Chemicals Inc., Wayne, Pa.

Filed Mar. 5, 1973, Ser. No. 337,954
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 P **5 Claims**

1. In a process for thermally dissociating a urethane to products including the corresponding isocyanate, said urethane having the following formula:



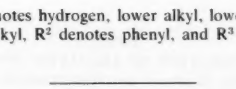
where *n* is an integer from 0 to 2,
where *m* is an integer from 1 to 3,
where R is methyl,
which comprises introducing the urethane into a non-catalytic pyrolysis zone maintained at a reaction temperature of the range of about 350°-550°C, and at a pressure less than (*m* + 1) times the vapor pressure of product isocyanate at the reaction temperature, removing vapor phase reaction products from said reaction zone cooling the reaction product vapors to condense out substantially all of the isocyanate therefrom while leaving at least 95 percent of the alcohol product in vapor form, the improvement wherein the urethane is introduced into the pyrolysis zone in solid particulate form and the residence time of the dissociation products in the pyrolysis zone is less than 1 second whereby a yield of at least 95 percent of theory isocyanate is prepared and recovered.

3,870,740
SUBSTITUTED O-(AMINOSULFONYL)-GLYCOLIC ANILIDES

Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim; Dietrich Mangold, Neckargemuend, and Wolfgang Rohr, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Jan. 5, 1973, Ser. No. 321,548
Claims priority, application Germany, Jan. 13, 1972, 2201432
Int. Cl. C07c *143/02, 143/08, 143/20*
U.S. Cl. 260—456 A **15 Claims**

1. A substituted 0-(aminosulfonyl)-glycolic anilide of the formula

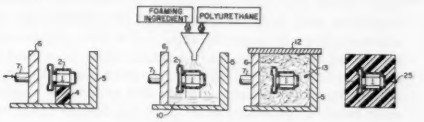


where R^1 denotes hydrogen, lower alkyl, lower haloalkyl or lower cycloalkyl, R^2 denotes phenyl, and R^3 denotes lower alkynyl.

3,870,741
METHOD OF MAKING A FOAM PACKAGE

George B. Kuhn, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 29,870, April 20, 1970, abandoned. This application May 4, 1972, Ser. No. 250,460
Int. Cl. B29d *27/00*; **B65d** *75/00, 85/30*
U.S. Cl. 264—46.4 **1 Claim**



1. The method of forming a foam package which comprises supporting a piece of film on a support in a mold, placing the article to be packaged on the film above the support, covering the top and sides of the article with another piece of film, the pieces of film being large enough to overlap at the sides of the article, introducing into the mold (a) sufficient polyurethane precursor of the class consisting of polyesters and polyethers, (b) an excess of polyisocyanate, and (c) foaming agent in the proportions to produce a foam and allowing the mixture to foam and completely enclose the article, whereby the rising foaming mixture lifts the outer portion of the lower piece of film and closes it against the portions of the upper piece which are at the sides of the article and fills the mold to surround the article, and then removing the foam package from the mold.

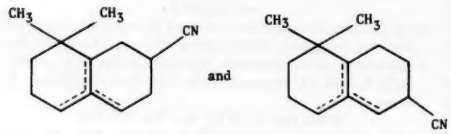
3,870,742

ISOMERIC MIXTURE OF BICYCLIC NITRILES AND THEIR METHOD OF PREPARATION

Erich Klein, Holzminden, Germany, assignor to Dragoco Spezialfabrik konz. Riech-und Aromastoffe Gerberding & Co. GmbH, Holzminden, Germany

Filed July 5, 1972, Ser. No. 269,027
Claims priority, application Germany, Mar. 6, 1972, 2210762
Int. Cl. C07c 121/02, 121/48
U.S. Cl. 260—464 2 Claims

1. A mixture of isomers of bicyclic nitriles comprising



Ia Ib

the single double bond present in Ia and Ib being located in any of the three positions indicated by the dotted line, said mixture of isomers being prepared by the cyclization of the isomers obtained by the reaction of equivalent amounts of myrcene and acrylonitrile.

3,870,743

PREPARATION OF AROMATIC DINITRILES

Gunther Ibing, Gladbeck, and Kurt Neubold, Bottrop, both of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed June 17, 1970, Ser. No. 47,875
Claims priority, application Germany, June 18, 1969, 1930880
Int. Cl. C07c 121/02, 121/54
U.S. Cl. 260—465 C 9 Claims

1. In the production of nitriles of aromatic dicarboxylic acids by the reaction of dialkyl-substituted benzenes with oxygen and ammonia at elevated temperature, the improvement which comprises employing as catalyst a mixture of vanadium and molybdenum oxides on alumina as carrier, which has been activated by about 0.1 to 50% of the combined weights of molybdenum and vanadium oxide of at least one of cerium, chromium, manganese, tungsten, bismuth, tin, antimony, titanium, lithium, sodium and potassium oxides, the mole ratio of vanadium oxide to molybdenum oxide ranging from about 0.5–2:1.

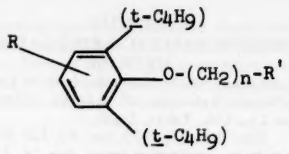
3,870,744

PROCESS FOR OXYGEN-ALKYLATION OF STERICALLY HINDERED PHENOLS

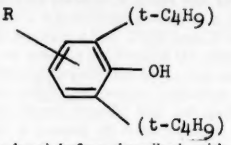
Eugene R. Wagner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 41,557, May 28, 1970, abandoned. This application Nov. 20, 1972, Ser. No. 307,935
Int. Cl. C07c 43/20, 65/02, 121/74
U.S. Cl. 360—465 F 9 Claims

1. A method for preparing oxygen-alkylated 2,6-di-tert-butylphenols of the formula:



wherein R is hydrogen, alkyl, halogen or alkylester; R′ is hydrogen, carboxy, amino, dialkylamino, nitrilo or alkyl ester, and n is an integer of from 1 to 6, inclusive, with the proviso that when R′ is hydrogen, n is at least 2, which comprises reacting a 2,6-di-tert-butylphenol reactant of the formula:



wherein R is as hereinbefore described, with an alkylating agent of the formula

$X\text{-}(CH_2)_n\text{-}R'$

wherein n and R′ are as hereinbefore described and X is halogen, said reaction being carried out at ambient temperatures and in the presence of a dipolar aprotic solvent and a base medium.

3,870,745

COMPLEX OF 2,6-DIMETHYLNAPHTHALENE AND 2-CYANO-6-METHYLNAPHTHALENE

Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Oct. 29, 1973, Ser. No. 410,650
Int. Cl. C07c 121/62
U.S. Cl. 260—465 R 3 Claims

1. As a composition a substantially equimolar complex of 2,6-dimethylnaphthalene and 2-cyano-6-methylnaphthalene.

3,870,746

PROCESS FOR RECOVERY OF PURE ACETONITRILE

Theodor Lussling; Gerd Schreyer; Ferdinand Theissen, all of Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt, Main, Germany

Filed Jan. 14, 1972, Ser. No. 217,843
Claims priority, application Germany, Jan. 22, 1971, 2102886
Int. Cl. C07c 121/18, 121/32
U.S. Cl. 260—465.3 9 Claims

1. In a process for the recovery of pure acetonitrile from an aqueous solution of acetonitrile containing organic impurities boiling below and above acetonitrile, said aqueous solution of acetonitrile having been obtained as byproduct in the reaction of propylene with ammonia and oxygen to form acrylonitrile, the improvement comprising:

1. extracting the aqueous solution of acetonitrile with an organic solvent extraction agent which has a higher boiling point than acetonitrile, is only slightly miscible with water, and does not form an azeotropic mixture with acetonitrile, said extraction agent being an alkyl substituted benzene having a total of 3 to 20 carbon atoms in the alkyl group or groups, benzonitrile or toluonitrile;
2. distilling off the portion volatile up to about 76°C. from this extract;
3. freeing the acetonitrile containing more difficulty volatile residue from water by distillation in the presence of a water entraining agent; and
4. recovering the pure acetonitrile by a fractional distillation.

3,870,747
INTERMEDIATES AND PROCESS FOR PROSTAGLANDIN SYNTHESIS

Norman L. Wendler, Summit; David Taub, Metuchen; Harry L. Slates, Westfield, and Zbigniew S. Zelawski, Piscataway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 24, 1971, Ser. No. 201,959
Int. Cl. C07c *69/74*
U.S. Cl. 260—468 G **5 Claims**

1. 3α,6,7,7a-Tetrahydro-1α-(loweralkoxycarbonyl)-4-methyl-2-oxindaneheptanoic acid and loweralkyl esters or esters with a loweralkyl group substituted with an aromatic group of from 6 to 10 carbon atoms.

3. The process of preparing the compound of claim **1** in which the diloweralkyl ester or diloweralkyl ester substituted with an aromatic group of from 6 to 10 carbon atoms of 3-methyl-3-cyclohexene-1α,2α-diacetic acid is treated with an alkali metal loweralkoxide in a solvent at from 50°C. to the boiling point of the reaction mixture for from ½to 3 hours, and subsequently treated with the loweralkyl ester or loweralkyl ester substituted with an aromatic group of from 6 to 10 carbon atoms of ω-iodoheptanoic acid at from 100°–200°C. for from 10 to 30 hours.

3,870,748
2-HYDROXY-1,1,2,3,3-PENTAHYDRO-PERFLUOROALKYL DERIVATIVES

Atsuo Katsushima; Iwao Hisamoto; Shoshin Fukui; Chiaki Maeda; Akitoshi Iwatani; Takahisa Kato; Masayuki Nagai; Hiroyuki Shinkai, all of Osaka, and Masayuki Asaoka, Kyoto, all of Japan, assignors to Daikin Kogyo Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 877,497, Nov. 17, 1969, abandoned. This application Oct. 24, 1972, Ser. No. 299,741
Claims priority, application Japan, Nov. 18, 1968, 43-84276; Dec. 5, 1968, 43-89252; Dec. 19, 1968, 43-93513; Dec. 19, 1968, 43-93514; Feb. 7, 1969, 44-9524; Mar. 10, 1969, 44-18411; Sept. 18, 1969, 44-74146
Int. Cl. C07c *69/34, 69/60, 69/80*
U.S. Cl. 260—475 F **5 Claims**

1. A compound of the formula:

$$[RfCH_2CH(OH)CH_2OOC]_mQ$$

wherein Rf is a perfluoroalkyl group, an ω-hydro-perfluoroalkyl group or an ω-chloro-perfluoroalkyl group having **4** to **20** carbon atoms, Q is $-(CH_2)_p-$, $-CH{=}CH-$, or $-C_6H_4-$, in which *p* is an integer of **1–4** and *m* is **2**.

3,870,749
PREPARATION OF SALTS AND COMPLEXES OF SUBSTITUTED OXYACETATE

Andre Danesh, 8 Browne St., Brookline, Mass. 02146

Filed Mar. 10, 1971, Ser. No. 123,025
Int. Cl. C07c *59/22, 69/66*
U.S. Cl. 260—484 P **9 Claims**

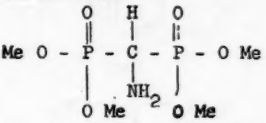
1. A process for the preparation of the disodium salt of diglycolic acid or lower alkyl,ester thereof, said process comprising reacting formaldehyde with a member selected from the group consisting of carbon monoxide and sodium glycolate, said reaction being performed in a liquid medium selected from the group of water and a lower alkyl alcohol at a temperature in excess of 30°C. and a pressure in excess of 1 atmosphere in the presence of sodium hydroxide.

3,870,750
PROCESS FOR THE PRODUCTION OF AMINOMETHANE-DIPHOSPHONIC ACID AND ITS SALTS

Klaus Wollmann; Walter Ploger, both of Hilden, and Karl-Heinz Wopms, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Continuation of Ser. No. 90,455, Nov. 17, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,605
Claims priority, application Germany, Nov. 19, 1969, 1958124
Int. Cl. C07f *9/38*
U.S. Cl. 260—502.5 **10 Claims**

1. A process for the production of an amino-methane-diphosphonate of the formula



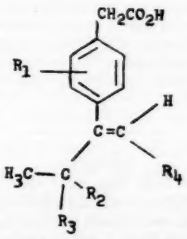
wherein Me represents a member selected from the group consisting of hydrogen and alkali metal which comprises the steps of reacting a phosphorus trihalide selected from the group consisting of phosphorus trichloride and phosphours tribromide with formamide at a temperature of from 0° to 75°C, wherein the molar ratio of said phosphorus trihalide to formamide is from about 4:1 to 1:4, subjecting the resultant reaction product to hydrolysis and recovering said aminomethane-diphosphonate.

3,870,751
SUBSTITUTED PHENYL ACETIC ACIDS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Feb. 20, 1973, Ser. No. 333,894
Int. Cl. C07c *63/60*
U.S. Cl. 260—515 R **5 Claims**

1. A compound of the formula



where,

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy and

R_2 and R_3 each independently represent alkyl having one or two carbon atoms, and

R_4 represents hydrogen, or lower alkyl or a pharmaceutically acceptable salt thereof.

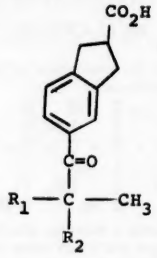
3,870,752

ACYL SUBSTITUTED INDANE CARBOXYLIC ACIDS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsipanny, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Aug. 31, 1973, Ser. No. 393,475
Int. Cl. C07c 65/20
U.S. Cl. 260—515 R 3 Claims

1. A compound of the formula



where R_1 and R_2 each independently represent alkyl having 1 to 2 carbon atoms, or a pharmaceutically acceptable salt thereof.

3,870,753

PROCESS FOR PREPARING INDENYL ACETIC ACIDS

Roger J. Tull, Metuchen; Robert F. Czaja, Scotch Plains; Richard F. Shuman, Westfield, and Seemon H. Pines, Murray Hill, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 20, 1973, Ser. No. 426,864
Int. Cl. C07c 147/00
U.S. Cl. 260—515 A 6 Claims

1. A process for preparing 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl acetic acid or its acid addition salt which comprises the steps of:

a. condensing in the presence of a base 5-fluoro-2-methyl-1-R_1-benzylindene, wherein R_1 is p-methylthio or p-methylsulfinyl with glyoxylic acid, its salt or ester, to form the corresponding 5-fluoro-2-methyl-1-(p-methylthio[or methylsulfinyl]benzyl)-indenylidene-3-acetic acid, salt or ester; and

b. isomerizing said indenylidene compound in the presence of a base or acid to form the desired indenyl-3-acetic acid compound when R_1 is p-methylsulfinyl; when R_1 is methylthio, isomerizing said indenylidene-3-acetic acid from Step (a) to form 5-fluoro-2-methyl-1-p-methylthiobenzylidene-3-indenyl acetic acid and subsequently oxidizing said 3-indenyl acetic acid or alternatively first oxidizing said 3-indenylidene acetic acid to form the corresponding 1-p-methylsulfinyl compound and subsequently isomerizing said 1-p-methylsulfinyl compound.

3,870,754

PROCESS FOR THE PREPARATION OF 2,6-NAPHTHALENEDICARBOXYLIC ACID

Gentaro Yamashita, and Kiyoshi Yamamoto, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 28, 1972, Ser. No. 284,109
Int. Cl. C07c 63/38, 63/02
U.S. Cl. 260—524 R 5 Claims

1. A process for the preparation of 2,6-naphthalenedicarboxylic acid which comprises contacting 2,6-dimethylnaphthalene with molecular oxygen in acetic acid containing less than 20 percent by weight of water as the solvent and in the presence of an oxidation catalyst, wherein:

A. not more than 1 mole of 2,6-dimethylnaphthalene is used per 100 mols of acetic acid;

B. the contact is at a temperature of from 160° to 250°C.; and

C. the oxidation catalyst consists essentially of

1. cobalt compounds wherein at least 0.05 but not more than 2.0 grams atoms of cobalt per 100 mols of acetic acid are present,

2. manganese compounds wherein at least 0.02 but not more than 2.0 gram atoms of manganese per 100 mols of acetic acid are present, and

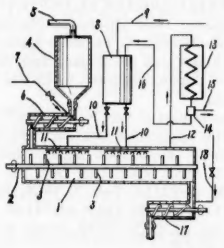
3. bromine or bromine compounds wherein at least 0.02 but not more than 2.0 gram atoms of bromine per 100 mols of acetic acid are present.

3,870,755

METHOD FOR MANUFACTURING NITROGEN-CONTAINING COMPOUNDS

Seiichi Kamo, Tokyo; Noriyoshi Yanai, and Naoto Osako, both of Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 864,273, Sept. 29, 1969, which is a continuation of Ser. No. 731,665, Jan. 24, 1968, abandoned, Continuation of Ser. No. 637,609, May 10, 1967, abandoned, Continuation of Ser. No. 451,538, May 28, 1965, abandoned.
This application Feb. 16, 1972, Ser. No. 226,957
Int. Cl. C07c 127/12
U.S. Cl. 260—553 R 10 Claims



1. In a method of manufacturing an alkylidene diurea product by the reaction of solid urea and an alkyl aldehyde having 3 to 4 carbon atoms in the substantial absence of a solvent for said urea in the presence of a aqueous acid catalyst selected from the group consisting of hydrochloric acid, sulfuric acid, phosphoric acid, acetic acid, formic acid, monochloroacetic acid, oxalic acid, citric acid, tartaric acid, benzene sulfuric acid and toluene sulfonic acid, the improvement which comprises carrying out the reaction with stirring in a nongas-tight vessel; continuously introducing solid urea into said reaction zone and continuously introducing said aldehyde in liquid form into said reaction zone by spraying in the ratio of 1 mole of urea to 0.6 to 1.1 moles of said aldehyde; maintaining the temperature of the reaction mixture above the boiling temperature of said aldehyde in the reaction zone and up to 20°C higher than the said boiling temperature by an autogenous balance between the heat of reaction and the latent heat of evaporation of by-product water and said aldehyde by permitting said water and unreacted aldehyde to evaporate;

maintaining the pH of reaction product less than 6 by addition of said catalyst to said reaction zone;

continuously discharging the evaporated aldehyde as vapor from said aldehyde vapor outlet; and continuously removing the product from said zone.

3,870,756

PROCESS FOR THE MANUFACTURE OF N,N-DIETHYL--TOLUAMIDE BY AQUEOUS CAUSTIC PROCEDURE

Leonard C. Ellis, Chesapeake, and Mearl A. Kise, Portsmouth, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 84,157, Oct. 26, 1970, abandoned. This application Nov. 17, 1972, Ser. No. 307,619

Int. Cl. C07c *103/34*

U.S. Cl. 260—558 A 3 Claims

1. A method in the preparation of N,N-diethyl-m-toluamide comprising:

A. first reacting meta-toluic acid with phosphorus trichloride while simultaneously draining waste products and thereafter substantially raising the reaction temperature to the range of 90°–140°C. to complete conversion of the acid in the reaction to yield meta-toluoyl chloride;

B. secondly, charging an amidation reactor with an entire charge of diethylamine, thereafter gradually feeding portions of the meta-toluoyl chloride into the reactor while agitating same, thereby forming the N,N-diethyl-m-toluamide and the by-product diethylamine hydrochloride;

C. thirdly, forming an aqueous solution of caustic soda having a concentration up to and including 50 percent and continuously alternating: the addition to the by-product of portions of said caustic solution, with the addition of portions of fresh meta-toluoyl chloride, to form by said additions a reaction mixture having a water content of less than 40 weight percent; simultaneously maintaining the reaction temperature at 20°–55°C. and agitating said reaction mixture to liberate diethylamine from its hydrochloride salt;

D. sequentially heating the product mixture at 70°–75°C. to yield a crude organic product layer of N,N-diethyl-m-toluamide.

3,870,757

PROCESS FOR THE PREPARATION OF OXOCARBOXYLIC ACID AMIDES AND OXOCARBOXYLIC ACIDS

Richard Kirchlechner; Werner Rogalski, and Jurgen Seubert, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Aug. 18, 1972, Ser. No. 281,651

Claims priority, application Germany, Aug. 21, 1971, 2141947

Int. Cl. C07c *103/22*

U.S. Cl. 260—559 R 3 Claims

1. 5-Chloro-8-methoxy-3-methyl-1-oxo-1,2,3,4-tetrahydro-3-naphthylacetamide.

3,870,758

CATALYTIC PREPARATION OF FORMANILIDE

Theodore C. Kraus, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 10, 1973, Ser. No. 405,249

Int. Cl. C07c *103/24*

U.S. Cl. 260—562 R 2 Claims

1. A process for the preparation of formanilide which comprises reacting aniline with carbon monoxide in the presence of a catalytic amount of nickel-bis-quinoline diiodide at a temperature of 150°–325°C. and at an elevated pressure in the range of 1000 to 5000 psig.

3,870,759

1-ADAMANTYL ALKYL KETONES AND THEIR PREPARATION

Yoshiaki Inamoto, and Hirokazu Nakayama, both of Wakayama, Japan

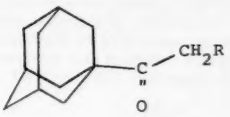
Filed July 13, 1970, Ser. No. 54,585

Claims priority, application Japan, July 19, 1969, 44-57130

Int. Cl. C07c *45/00*

U.S. Cl. 260—586 G 4 Claims

1. A process for preparing 1-adamantyl alkyl ketone of the formula (I)



(I)

wherein R is a linear or a branched alkyl group having 1 to 20 carbon atoms, which comprises alkylating ethyl 1-adamantylcarbonylacetate with a compound of the formula RX, wherein R has the same meaning as in formula I and X is halogen, sulfate, $C_6H_5SO_3$— or p—$CH_3C_6H_4SO_3$, saponifying the resulting α-alkyladamantylcarbonyl acetic ester in an alcoholic alkali metal hydroxide solution and then decarboxylating the free acid thus obtained in an acidic aqueous medium.

3,870,760

PREPARATION OF OXIDATION PRODUCTS OF CYCLOALKANES

Kyugo Tanaka, Yokohama; Shozo Oshima, Tokyo, and Itaru Watanabe, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1972, Ser. No. 239,390

Claims priority, application Japan, Mar. 31, 1971, 46-18783; Aug. 2, 1971, 46-57498; Nov. 1, 1971, 46-86278

U.S. Cl. 260—586 P 11 Claims

1. A process for producing a mixture of the corresponding cycloalkylhydroperoxide, cycloalkanol and cycloalkanone which comprises oxidizing a cycloalkane having 5 to 12 carbon atoms with molecular oxygen in the liquid phase in the presence of an aliphatic or aromatic hydrocarbon nitrile compound having 2 to 8 carbon atoms at a temperature of from about 100° to 200°C. under a pressure of from atmospheric pressure to about 50 Kg./cm^2 gauge at a weight ratio of said cycloalkane to said aliphatic or aromatic nitrile compound of from 20:1 to 1:3.

3,870,761

MANUFACTURE OF PIPERITENONE

Heinrich Pasedach, Ludwigshafen, and Albrecht Friederang, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed July 17, 1972, Ser. No. 272,147

Claims priority, application Germany, July 23, 1971, 2136885; Jan. 27, 1972, 2203807

Int. Cl. C07c *49/48, 45/00, 29/00*

U.S. Cl. 260—586 C 6 Claims

1. A process for the manufacture of piperitenone by reaction of methyl vinyl ketone with mesityl oxide in the presence of a basic catalyst, in thich methyl vinyl ketone is slowly introduced into a mixture consisting essentially of excess mesityl oxide and, as the catalyst, 40 to 60% w/w aqueous potassium hydroxide solution, the mixture is brought to a temperature of 50° to 80°C, the potassium hydroxide is used in an amount of 0.05 mole to 1.5 mole per mole of methyl vinyl ketone, and the methyl vinyl ketone is introduced into said mixture at said temperature.

3,870,762

DEHYDROCHLORINATION PROCESS

Martyn Hugh Stacey, and Terrence Donald Tribbeck, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 16, 1972, Ser. No. 307,209

Claims priority, application Great Britain, Dec. 2, 1971, 56007

Int. Cl. C07c *21/08*

U.S. Cl. 260—654 D 7 Claims

1. In a process for the manufacture of vinylidene chloride from 1,1,2-trichloroethane by catalytic dehydrochlorination, the improvement which comprises dehydrochlorinating in the vapour phase in the presence of a catalyst which comprises member of the group consisting of the chlorides and fluorides of potassium, caesium, rubidium and mixtures thereof at a temperature in the range from 125°C to 275°C.

3,870,763

CONVERSION OF ACYCLIC POLYENES

Louis F. Heckelsberg, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 190,287, Oct. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 73,65, Jan. 28, 1970, abandoned, which is a continuation of Ser. No. 627,858, April 3, 1967, abandoned. This application Nov. 29, 1971, Ser. No. 203,066

Int. Cl. C07c *3/62*

U.S. Cl. 260—666 A 18 Claims

1. The process of converting an acyclic polyene in the olefin reaction process to produce at least one olefinic hydrocarbon having a different number of carbon atoms per molecule than the acyclic polyene which comprises contacting at a reaction temperature in the range of about 400° to 1100°F a feed-stream containing said acyclic polyene with a catalyst active for disproportionation of propylene into ethylene and butene and under conditions selected within the temperature range for which the selected catalyst is active for promoting the olefin reaction process which, as defined herein, can be visualized as comprising the reaction between two first pairs of carbon atoms, the two carbon atoms of each first pair being connected by an olefinic double bond, to form two new pairs from the carbon atoms of said first pairs, the two carbon atoms of each of said new pairs being connected by an olefinic double bond, the amount of said acyclic polyene in said stream being at least about 1 part per 20 parts of any monoolefin present, there being at least about 1 part of monoolefin per 20 parts of acyclic polyene when the reaction temperature is less than about 600°F wherein said catalyst is

a. silica promoted by an oxide of tungsten.

3,870,764

OXIDATIVE DEHYDROGENATION PROCESS

Robert S. Gichowski, San Luis Obispo, Calif., and Floyd E. Farha, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 21, 1972, Ser. No. 264,932

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E 10 Claims

1. An oxidative dehydrogenation process which comprises contacting at least one dehydrogenatable organic compound containing at least one

grouping under oxidative dehydrogenation conditions including the presence of molecular oxygen with a catalyst composition comprising (I) iron, (II) phosphorus, (III) gallium, and (IV) oxygen, sulfur, or oxygen and sulfur, each of said (I), (II), (III), and (IV), calculated as the element, present in a ratio sufficient to provide catalytic effectiveness, wherein said catalyst composition contains about 15 to 45 weight percent said (I), about 15 to 40 weight percent said (II), and about 0.1 to 10 weight percent said (III),

wherein said dehydrogenatable organic compound comprises an acyclic hydrocarbon monoolefin of 3 to 12 carbon atoms per molecule, cyclic hydrocarbon alkenes of 4 to 10 carbon atoms per molecule, alkylpyridines or alkylaromatics containing 1 to 4 alkyl groups per molecule wherein the alkyl group contains 1 to 6 carbon atoms per group such that at least 1 alkyl group has at least 2 carbon atoms, and cyclic or acyclic alkadienes of 4 to 12 carbon atoms per molecule.

3,870,765

ALKYLATION AIDS

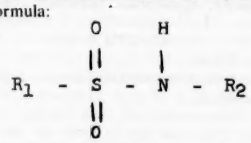
Frederic C. McCoy, Beacon, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 14, 1973, Ser. No. 370,195

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.51 7 Claims

1. In an alkylation process wherein an isoparaffin hydrocarbon is alkylated with an olefin hydrocarbon in the liquid phase, in the presence of an alkylation catalyst comprising an acid selected from the group consisting of hydrogen fluoride, sulfuric acid, and mixtures of sulfuric acid and fluorosulfonic acid, and employing an alkylation aid selected from the group consisting of aliphatic amines having an alkyl radical of 12 to 24 carbon atoms, halogen salts of alkyl ammonium compounds having at least one alkyl radical of 12 to 20 carbon atoms, phosphonium salts having at least one aliphatic radical of 12 to 20 carbon atoms, sulfonium salts having at least one aliphatic radical of 12 to 20 carbon atoms, and compounds having the formula:



wherein R_1 is selected from alkyl, aromatic, and alkyl aromatic radicals, and wherein R_2 is alkyl of from 8 to 30 carbon atoms;

The improvement which comprises:

a. mixing said alkylation aid with an alkyl phenol solubilizing agent selected from the group consisting of mono- and di-nuclear aromatics having at least one phenolic hydroxyl group and at least one aliphatic side chain of from 6–50 carbon atoms, and with hydrocarbon solvent boiling in the range of from 25°C to about 220°C, forming a clear solution comprising about 5 to 15 weight percent alkylation aid, about 5 to 50 weight percent alkyl phenol and about 40 to 90 weight percent hydrocarbon solvent; and

b. employing, in the alkylation process, from about 0.0033 weight percent to about 20 weight percent, based on acid catalyst, of said solution.

3,870,766

METHOD OF CURING ORGANIC POLYMERS AND COPOLYMERS

Rajendra Nath Chadha, Farmingdale, N.Y., assignor to Stauffer Chemical Company, Adrian, Mich.

Division of Ser. No. 154,594, June 18, 1971, Pat. No. 3,776,977, which is a continuation-in-part of Ser. No. 37,409, May 11, 1970, abandoned. This application Sept. 4, 1973, Ser. No. 394,215

Int. Cl. C08g 47/10

U.S. Cl. 260—825 9 Claims

1. A curable composition comprising a hydroxylated organopolysiloxane fluid and a silylated organic polymer having one or more silyl groups of the formula

$$\begin{matrix} R_{3-z} \\ | \\ -SiX_z \end{matrix}$$

connected thereto, wherein R is selected from the group consisting of hydrocarbon radicals and halogenated hydrocarbon radicals, X is a reactive group capable of condensing with the hydroxyl groups of the organopolysiloxane, and z is a number of from 1 to 3, said silylated organic polymer being derived from organic monomers containing a carbon-to-carbon double bond and contains at least 3 reactive X groups per molecule.

3,870,767

OLEOPHOBIC AND HYDROPHOBIC POLYMERS CONTAINING POLYMERIZATION PRODUCT OF FLUORINATED SULFONAMIDO ETHYLENE MOIETIES

Edouard Grimaud, Oullins, and Maurice Troussier, Pierre-Benite, both of France, assignors to Pechiney Ugine Kuhlmann, Paris, France

Filed Oct. 6, 1972, Ser. No. 295,653

Claims priority, application France, Oct. 8, 1971, 71.36310

Int. Cl. C08g 45/04, 19/00

U.S. Cl. 260—836 6 Claims

1. Oleophobic and hydrophobic polymers obtained from the polymerization of one or more polyfluorinated sulfonamidoethylene acrylate or methacrylate monomers in the presence of a nonfluorinated acrylic resin which represents from 20 to 80% by weight of the monomer and resin and wherein the fluorinated sulfonamidoethylene moiety of the monomers is presented by the radical

$$C_nF_{2n+1}-CH_2-CH_2-SO_2-\underset{R}{N}-CH_2-CH-$$

in which C_nF_{2n+1} represents a straight or branched perfluorinated chain with n being an integer from about 1 to 20 and R is a hydrogen atom, an alkyl radical of from 1 to 10 carbon atoms, a cycloalkyl radical of from 5 to about 12 carbon atoms, and unsubstituted aryl radical or an aryl radical substituted with an an alkyl radical of from 1 to about 6 carbon atoms or the radical R'OH with R' being an alkylene radical of from 2 to 4 carbon atoms and the nonfluorinated acrylic resin is selected from the group comprising an alkylacrylate or an alkylmethacrylate homopolymer in which the alkyl radical contains from about 1 to 20 carbon atoms; a copolymer containing several alkylacrylates or alkylmethacrylates in which the alkyl radicals contain from about 1 to 20 carbon atoms; and a copolymer containing one or more alkylacrylates or alkylmethacrylates wherein the alkyl radicals contain from about 1 to 20 carbon atoms and from 0.5 to 20% by weight of one or more monomers selected from N-methylolacrylamide, hydroxyethylacrylate, hydroxpropylacrylate, hydroxyethylmethacrylate, hydroxypropylmethacrylate, glycidylacrylate, glycidylmethacrylate, acrylic acid and methacrylic acid.

3,870,768

UNSATURATED AMIDES OF OXYBIS(BENZENESULFONIC ACID) AND THEIR USE AS CROSS-LINKING AGENTS

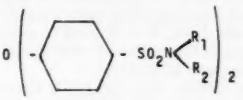
John C. Blackwood, Melrose; Edwin O. Hook, Marshfield, and Walter Beck, Bedford, all of Mass., assignors to Stepan Chemical Company, Wilmington, Mass.

Division of Ser. No. 180,850, Sept. 15, 1971, Pat. No. 3,725,476. This application Oct. 27, 1972, Ser. No. 301,301

Int. Cl. C07c 143/78; C08f 27/06

U.S. Cl. 260—857 G 15 Claims

1. A process of preparing a cross-linked polymer, which process comprises: incorporating an unsaturated oxybis(benzenesulfonamide) in a polymer subject to cross-linking, the sulfonamide having the formula:



wherein:

R_1 is a C_2—C_{12} alkenyl radical wherein the terminal carbon atom has two hydrogen atoms and is bonded to the penultimate carbon atom by means of a double bond; and

R_2 is a R_1 radical, a C_1—C_6 alkyl radical, a phenyl radical or hydrogen,

the oxybis(benzenesulfonamide) being present in an amount ranging from about 0.1 to 30% by weight of the polymer; and, thereafter, cross-linking the polymer with the unsaturated oxybis(benzenesulfonamide).

3,870,769

THERMOPLASTIC RESIN-GRAFT-POLYBLEND COMPOSITIONS

Shuji Yoshida, Chiba, and Tateo Iguchi, Ichihara, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 334,702, Feb. 22, 1973, Pat. No. 3,830,873. This application Mar. 12, 1974, Ser. No. 450,299

Claims priority, application Japan, Feb. 26, 1972, 47-20045

Int. Cl. C08f 41/12, 29/56

U.S. Cl. 260—876 R 6 Claims

1. Thermoplastic resin compositions prepared by the steps of copolymerizing 0.5 to 25 parts by weight of at least one compound selected from the group consisting of acrylic and methacylic esters of 3-methoxy butanol with 99.5 to 75 parts by weight of monomers consisting of alkyl acrylate wherein the alkyl group has 2 to 8 carbon atoms to obtain a rubbery copolymer A; graftpolymerizing 100 parts by weight of said rubbery copolymer A with 100 to 300 parts by weight of at least one compound selected from the group consisting of aromatic vinyl compounds, vinyl cyanides and mixtures of either of said both types of compounds and monomers copolymerizable therewith in the presence of 0 to 0.5 parts by weight of a chain transfer reagent to obtain a graftpolymer B; and blending said graftpolymer B with a polymer C separated prepared from at least one compound consisting of aromatic vinyl compounds, vinyl cyanides and mixtures thereof so as to cause said graftpolymer B to be uniformly dispersed in particle sizes of 150 to 1000 millimicrons in said polymer C.

3,870,770
GRAFT COPOLYMER OF ETHYLENICALLY UNSATURATED CARBOXYLIC ACIDS ONTO A SUBSTRATE OF POLY-N-VINYL LACTAMS

William R. Peterson, and Walter N. Johnson, both of Chattanooga, Tenn., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 171,006, Aug. 11, 1971, abandoned. This application June 15, 1973, Ser. No. 370,421
Int. Cl. C08f *15/00*
U.S. Cl. 260—879 **6 Claims**

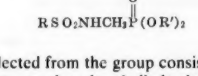
1. A graft copolymer of a monomer mixture containing at least one monomeric unsaturated aliphatic carboxylic acid and at least one monomer selected from the group consisting of aliphatic conjugated dienes and monoalkenyl aromatic compounds polymerized on a polymeric N-vinyl lactam substrate, said copolymer containing approximately by weight 0 to 98 parts of said diene, 0 to 75 parts of said monoalkenyl aromatic compound, 0.5 to 20 parts of said acid, and 1 to 99 parts of said polymeric lactam.

3,870,771
DIALKYL ALKYL AND AROMATIC SULFONAMIDOMETHYL PHOSPHONATES

Peter Golborn, Lewiston, and James J. Duffy, Buffalo, both of N.Y., assignors to Hooker Chemical & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,757
Int. Cl. C07f *9/40*
U.S. Cl. 260—944 **6 Claims**

1. A compound of the formula



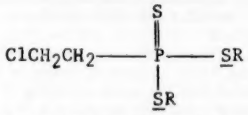
wherein R is selected from the group consisting of lower alkyl of 1–6 carbon atoms, phenyl and alkyl substituted phenyl and R′ is selected from the group consisting of phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1–6 carbon atoms.

3,870,772
2-CHLOROETHYL-PHOSPHONOTHIOIC ESTERS AND THIOESTERS

David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 869,915, Oct. 27, 1969, abandoned. This application Sept. 22, 1972, Ser. No. 291,365
Int. Cl. C07f *9/40, 9/38;* **A01n** *9/36*
U.S. Cl. 260—961 **2 Claims**

1. Compounds of the following formula



wherein R is, alkyl of 1 to 5 carbon atoms, phenyl, tolyl, xylyl, or benzyl.

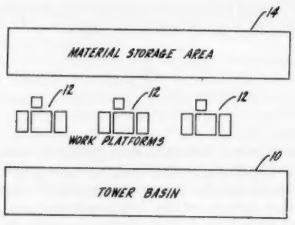
3,870,773
COOLING TOWER

Samuel Luzaich, Santa Rosa, Calif., assignor to Ecodyne Corporation, Chicago, Ill.

Filed May 22, 1972, Ser. No. 255,602
Int. Cl. B01f *3/04*
U.S. Cl. 261—111 **1 Claim**

1. A method of constructing the fill area of a large wood frame cooling tower wherein air is displaced to flow directionally, generally laterally, within the fill area of the tower in cooling relation with dropping particulate liquid, comprising the steps of:

a. pouring a concrete foundation to serve as the cold water storage basin;
b. constructing special work platforms adjacent the foundation;
c. fabricating the framework of lower, intermediate, and upper fill area modules on said work platforms;
d. connecting fill hangers within the framework of said modules;

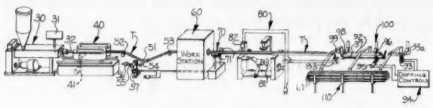


e. positioning fill material within said modules on said fill hangers;
f. attaching cell separating partition walls to specific modules while on said platform;
g. attaching longitudinal cross braces to specific modules while on said platforms; and
h. lifting said lower, intermediate, and upper modules from said platform and respectively securing them directly to each other one alongside another and one atop of another above said foundation to form the entire structure of said fill area.

3,870,774
PIPE DOFFING AND BUNDLING METHOD

Ernest J. Maroschak, Box 878, Rosenboro, N.C. 28382

Continuation-in-part of Ser. No. 278,003, Aug. 4, 1972,. This application Sept. 1, 1972, Ser. No. 285,928
Int. Cl. B29c *17/07, 17/16;* **B65b** *13/02*
U.S. Cl. 264—40 **13 Claims**

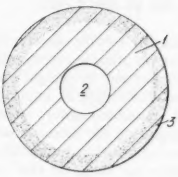


1. A method of forming bundles of cut lengths of an elongate flexible plastic tube, said method comprising continuously extruding a tube of plastic material into a molding zone while molding annular corrugations of alternating ribs and valleys on the tube during the forward movement thereof through the molding zone, delivering the corrugated tube from the molding zone and advancing the tube through a cutting station while successively cutting the tube into predetermined cut lengths, feeding each successive individual cut length along a path of travel forwardly of the cutting station a predetermined distance and in response thereto quickly ejecting each successive cut length out of the path of travel by engaging each cut length intermediate its ends and moving the same laterally out of the path of travel, accumulating and stacking a plurality of cut lengths in nesting relation, and securing pliable binding elements around the stacked cut lengths to form a bundle thereof after a predetermined number of the cut lengths have been accumulated.

3,870,775
METHOD OF MAKING SHAPED ARTICLES

Roger Albert Castro, East Varnet; Richard John Orman, Welwyn Garden City, and James Ernest Ryan, Knebworth, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 6, 1972, Ser. No. 231,858
Claims priority, application Great Britain, Mar. 10, 1971, 6460/71
Int. Cl. B29c 5/04
U.S. Cl. 264—53 8 Claims

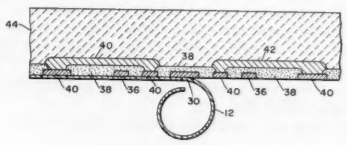


1. A method of forming a shaped article having a cellular structure and a fibrous filler concentrated at one surface thereof, comprising emulsifying a substantially water-immiscible curable resin as the continuous phase with an aqueous disperse phase, adding said fibrous filler to said emulsion and stirring the mixture so formed to distribute said filler throughout the emulsion, centrifuging the mixture in a mold for the article so as to migrate said filler to one surface thereof, and curing the rsin while maintaining the dispersed state of the aqueous phase to provide the cellular structure and while continuing rotation of the mold to maintain the concentration of said filler at said one surface.

3,870,776
METHOD FOR MAKING CERAMIC-METAL STRUCTURES

John F. McMahon, Barrington, R.I., assignor to Metalized Ceramics Corporation, Providence, R.I.

Filed Jan. 2, 1973, Ser. No. 320,621
Int. Cl. C04b 35/64, 37/02
U.S. Cl. 264—61 4 Claims



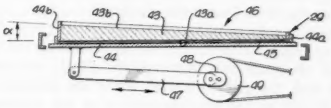
1. In the manufacture of composite structures for use as multi-layered components of a hermetic package from dielectric ceramic such as those composed mainly of alumina mixed with plasticizers, binders and solvents for said plasticizers and from a paste of powdered metal selected from the group composed of tungsten, molybdenum, manganese or mixtures thereof, the method which comprises the steps of depositing said paste upon a transport film to form a thin predetermined metallic pattern thereon, drying said metallic pattern, applying a thick body of said ceramic over said metallic pattern and upon said transport film, drying said ceramic body to form a green composite structure, and firing said green composite structure at a temperature higher than approximately 1,600°C to vitrify said ceramic and bond said metal hermetically to said ceramic, said transport film being burned away during said firing to leave a continuous planar surface suitable for hermetic sealing thereto of a further layer.

2. In the manufacture of composite structures for use as multi-layered components of a hermetic package from dielectric ceramic such as those composed mainly of alumina mixed with plasticizers, binders and solvents for said plasticizers and from a paste of powdered metal selected from the group composed of tungsten, molybdenum, manganese or mixtures thereof, the method which comprises the steps of depositing said paste upon a transport film to form a thin predetermined metallic pattern thereon, drying said metallic pattern, applying a thick body of said ceramic over said metallic pattern and upon said transport film, drying said ceramic body to form a green composite structure, stripping away said transport film, and firing said green composite structure at a temperature higher than approximately 1,600°C to vitrify said ceramic and bond said metal hermetically to said ceramic, the removal of said transport film leaving a continuous planar surface suitable for hermetic sealing thereto of a further layer.

3,870,777
CEMENTITIOUS ROOFING AND SIDING PRODUCTION

Gus R. Jakel, Glendale, Calif., assignor to California Cement Shake Co., Inc., Alhambra, Calif.

Filed Nov. 2, 1972, Ser. No. 303,225
Int. Cl. B28b 21/16
U.S. Cl. 264—71 7 Claims



1. In the method of making a cementitious product slab useful in construction, and employing a generally rectangular mold frame, a screen and a plate, the steps that include

a. preparing a flowable aqueous cementitious slurry consisting of about 58 percent water, about 39.5 percent lime, cement and perlite and the balance being non-aqueous components,

b. forming a selected quantity of the slurry into tapered slab shape, said forming step including supporting the mold frame and screen on the plate with the screen overlying the plate and inclined relative to horizontal, transferring said slurry quantity into the mold frame and onto the inclined screen, and vibrating said mold frame and screen via vibration transmission to said plate in the general direction of said taper and at a frequency of about 300 cycles per second and an amplitude of about 3/8 inch thereby vibrating said slurry quantity to aid slab shape formation, said forming step carried out with the upper surface of the slab maintained free to assume a generally horizontally flat configuration in response to said vibration and in the absence of direct pressurization of said surface, and including the step of maintaining the screen in supporting relation to the underside of the slab and to have inclination relative to said upper surface during said forming step so that the resultant slab has tapered shape,

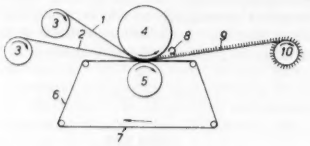
c. thereafter transferring the mold frame and screen to a pressurizing station and pressurizing the formed slab supported on the screen to squeeze water therefrom by subjecting the tapered slab to a sequence of pressurization applications, and

d. curing the resultant slab.

3,870,778
PROCESS FOR PIGMENTING A PILE SURFACED PRODUCT

Margaret Lilian Steel, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 19, 1972, Ser. No. 264,402
Claims priority, application Great Britain, June 21, 1971, 28958/71; Aug. 9, 1971, 37294/71
Int. Cl. B29c *17/02;* **B32b** *5/00*
U.S. Cl. 264—164 **16 Claims**

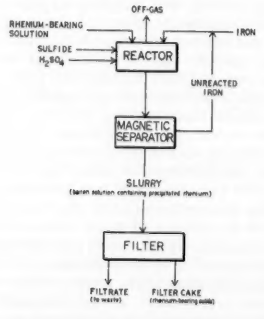


1. A process for the production of a pile surfaced product pigmented with a given pigment comprising passing a synthetic thermoplastic material having at least one surface which is free of the given pigment and a backing material to a heated pressing surface with said one surface of the synthetic material against said pressing surface under conditions such that if the synthetic thermoplastic material is not prebonded to the backing material bonding occurs between the two and the temperature of the pressing surface being such that the synthetic thermoplastic material temporarily adheres to said heated pressing surface, applying the given pigment to at least one of the synthetic material or the backing material prior to separating the synthetic thermoplastic material from said surface, and then separating the synthetic thermoplastic material from said heated pressing surface so that fibrils are drawn out from the synthetic thermoplastic material, the fibrils becoming pigmented with the given pigment under the influence of the action of said heated pressing surface on the synthetic thermosplastic material.

3,870,779
PROCESS OF RECOVERING RHENIUM VALUES FROM COMPLEX INDUSTRIAL SOLUTIONS

Craig Nellis Wright, and Kenneth Julian Richards, both of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 404,921
Int. Cl. C01g *47/00*
U.S. Cl. 423—50 **6 Claims**



1. A process of recovering rhenium values from dilute solutions thereof, comprising introducing a soluble sulfide into the solution in an amount of at least about 2 molecules sulfide per molecule of rhenium in the solution; introducing a base metal selected from the group consisting of iron, zinc, nickel, and manganese into the solution in an amount sufficient to precipitate soluble rhenium values therein as an insoluble species while maintaining the pH of the solution between about 0.5 and about 3.5; separating the precipitate from the solution; and recovering the rhenium from the precipitate.

3,870,780
PURIFICATION OF SODIUM CARBONATE

Joel P. Guptill, Syracuse, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 14, 1972, Ser. No. 289,032
Int. Cl. C01d *7/22*
U.S. Cl. 423—206 **11 Claims**

1. A method of reducing soluble silicates from an aqueous sodium carbonate solution prepared from calcined trona having at least about 20 percent by weight sodium carbonate dissolved therein, and containing as impurities, soluble silicates and suspended insoluble matter, which method comprises the steps of: digesting the aqueous sodium carbonate solution in the absence of additives to insolubilize the silicates at a temperature within the range of 160° and 240°F. for a time sufficient to remove at least 25 percent of the soluble silicates contained therein; and separating the digested solution from contained insoluble matter.

3,870,781
AIR POLLUTION CONTROL SYSTEM

Herschel Alan Klein, Windsor, and Carl Richard Bozzuto, Waterbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 27, 1972, Ser. No. 275,662
Int. Cl. C01b *17/00*
U.S. Cl. 423—242 **6 Claims**

1. A method of removing SO_2 from a flue gas stream comprising the steps of:

a. contacting said flue gas with an aqueous scrubbing solution containing NaOH and $CaSO_4$ whereby a portion of said NaOH reacts with said SO_2 to form sodium ions and bisulfite ions, said NaOH being present in an amount greater than that required to react with said SO_2 whereby excess NaOH will always be present and wherein the pH is maintained in the range of 5.0 to 5.6;

b. contacting said aqueous scrubbing solution from step (a) with oxygen whereby said bisulfite ions are oxidized to form hydrogen ions and sulfate ions in solution;

c. contacting said aqueous scrubbing solution from step (b) with CaO whereby $CaSO_4$ is precipitated and NaOH is formed in solution;

d. separating precipitated $CaSO_4$ from said aqueous scrubbing solution; and

e. recycling said aqueous scrubbing solution to step (a).

3,870,782
AMMONIUM NITRATE NEUTRALIZER

Toby M. Cook; Gerald L. Tucker, and Marion L. Brown, Jr., all of Yazoo City, Miss., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Division of Ser. No. 152,063, June 11, 1971, Pat. No. 3,758,277. This application June 7, 1972, Ser. No. 260,392
Int. Cl. C01b *21/48;* **C01c** *1/18*
U.S. Cl. 423—396 **5 Claims**

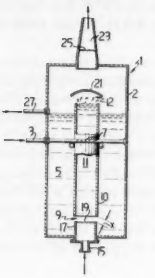
1. A method for neutralizing nitric acid with ammonium which comprises:

feeding nitric acid into an aqueous reaction zone;

feeding ammonia into an aqueous second reaction zone, which is contiguous with said first reaction zone and is in circulating communication therewith;

circulating the nitric acid into said second reaction zone such that when the acid enters the second reaction zone its concentration has been diluted to less than 0.5 percent by weight;

reacting a predominant proportion of the nitric acid with ammonia in said second reaction zone so as to form an ammonium nitrate containing solution; and



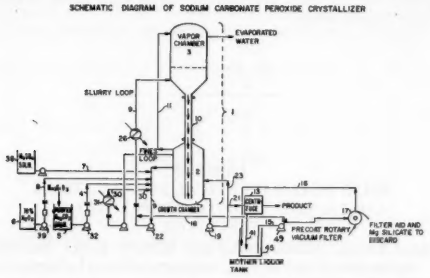
removing said ammonium nitrate containing solution from said second reaction zone, recirculating said solution to said first reaction zone and recovering an ammonium nitrate product from the recirculated solution before additional nitric acid diffuses into said recirculated solution.

3,870,783

PROCESS OF PREPARING SODIUM CARBONATE PEROXIDE

Richard E. Hall, Trenton, and Sushil K. Bhalla, Cranbury, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Sept. 13, 1972, Ser. No. 288,658
Int. Cl. C01b *15/10*
U.S. Cl. 423—415 **7 Claims**



1. A continuous process for the production of sodium carbonate peroxide comprising;

a. reacting aqueous feed solutions of hydrogen peroxide and sodium carbonate in essentially stoichiometric amounts in crystallization zone operated in the region of the phase diagram wherein the hydrogen peroxide concentration is about 1.5 to 4.0% or 17 to 50 g per 1, and the sodium carbonate is about 12 to 20% or from about 150 g to 250 g per 1, thereby making for a molar ratio of hydrogen peroxide to sodium carbonate from about 0.2 to about 0.7, at a pH from about 11.2 to about 11.7, at a temperature of from about 25°C to about 35°C, at a residence time of from about 5, hours to about 15 hours in the presence of about 10 to 70 ppm Mg as magnesium silicate, and about 0.005 to 0.5 g per 1 sodium silicate;

b. removing the so-formed crystalline slurry of sodium carbonate peroxide from the crystallization zone;

c. filtering the slurry;

d. drying the sodium carbonate peroxide product;

e. returning the mother liquor to the crystallizer and

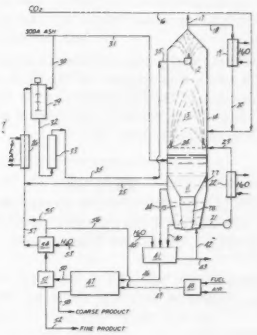
f. evaporating under vacuum excess water from the system while continuously introducing fresh hydrogen peroxide and sodium carbonate solution.

3,870,784

SODIUM BICARBONATE PRODUCTION

Walter C. Saeman, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 213,562, Dec. 29, 1971, abandoned. This application Nov. 10, 1972, Ser. No. 305,397
Int. Cl. C01d *7/10*
U.S. Cl. 423—422 **15 Claims**



1. A method for producing sodium bicarbonate by carbonating sodium carbonate in an absorber-crystallizer to precipitate sodium bicarbonate crystals which comprises:

1. maintaining in a crystallization zone a mixture comprising sodium bicarbonate crystals in an aqueous solution of sodium carbonate saturated and in equilibrium with sodium bicarbonate;
2. maintaining in a contiguous carbonating zone above said crystallization zone an atmosphere having at least 4% carbon dioxide;
3. spraying said mixture upwardly and inwardly into said atmosphere from the perimeter of said carbonating zone, through opposed nozzles adapted to maximize mid-air impingement of sprays eminating therefrom, removing evaporated water therefrom and collecting the resulting carbonated mixture in said crystallization zone;
4. removing from said carbonated mixture an aqueous stream containing suspended crystals of sodium bicarbonate;
5. separating said crystals as product from said aqueous stream and recycling the resultant mother liquor to said absorber-crystallizer.

3,870,785

PREOXIDATION AND PELLETING OF CARBON BLACK

Eulas W. Henderson, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

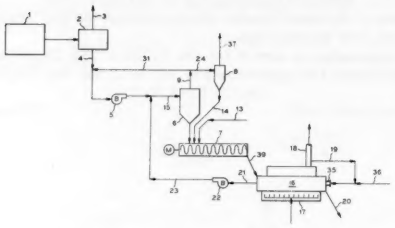
Filed Aug. 7, 1973, Ser. No. 386,306
Int. Cl. C01b *31/08*
U.S. Cl. 423—460 **10 Claims**

1. A method of pelleting carbon black which comprises:

A. withdrawing flocculent carbon black from a filter and introducing said flocculent carbon black and nitric acid into a pelleter;

B. pelleting said carbon black in contact with said nitric acid;

C. drying the carbon black pellets thereby releasing oxides of nitrogen therefrom; and



D. introducing said oxides of nitrogen into contact with said carbon black downstream of the filter and prior to the introduction of the flocculent carbon black into the pelleter so as to preoxidize said carbon black prior to the pelleting thereof in step (A).

3,870,786

REMOVAL OF PHOSPHATE COMPOUNDS FROM FLUORIDE CONTAINING SOLUTIONS

Gustave E. Kidde, 201 South Lake Avenue, Pasadena, Calif. 91101

Continuation of Ser. No. 89,126, Nov. 12, 1970, abandoned. This application Mar. 26, 1973, Ser. No. 345,112

Int. Cl. C01b *7/22, 7/00, 33/00*

U.S. Cl. 423—484 **11 Claims**

1. A process for the removal of phosphate contaminants from impure fluosilicic acid and hydrofluoric acid aqueous solutions having a pH of less than 2.6 comprising:

adding to said solution a water soluble aluminum salt in an amount sufficient to precipitate any phosphate contaminants as aluminum phosphate;

decreasing the acidity of said solution to a pH of at least 2.6 to 3.1; and

separating the resulting precipitate from the resulting phosphate contaminant free solution.

3,870,787

PIGMENT AND PREPARATION THEREOF

Warren B. Blumenthal, North Tonawanda, N.Y., assignor to N. L. Industries, Inc., New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 413,178

Int. Cl. C01g *23/00;* **C09c** *1/36*

U.S. Cl. 423—598 **15 Claims**

1. A crystalline compound having a composition which can be represented by the formula $CaTiZr_3O_9$ and characterized by an X-ray diffraction spectrogram, the most prominent *d* spacings of which are as follows:

d	R.I.
7.56	7
3.48	11
2.93	100
2.53	21
2.17	6
1.79	51
1.65	6–7
1.59	5
1.53	30
1.46	5–6

the relative intensities of the several listed diffracted reflections with respect to the intensity of the strongest reflection in the X-ray diffraction spectrogram of a typical product being as set forth in the column headed R.I..

3,870,788

HAFNIUM-TITANIUM-CALCIUM-OXYGEN PRODUCT

Warren B. Blumenthal, North Tonawanda, N.Y., assignor to NL Industries, Inc., New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 413,179

Int. Cl. C01g *23/00;* **C09c** *1/36*

U.S. Cl. 423—598 **6 Claims**

1. A process for producing a crystalline hafnium-titanium-calcium-oxygen reaction product having a composition corresponding substantially to the formula $CaTiHf_3O_9$ which comprises calcining in an oxidizing atmosphere and to a temperature of at least about 800°C, a chemically homogeneous, glassy conglomerate which consists essentially of Ti, Ca, Hf, O, and at least one thermally fugitive ligand per atom of metal content, the atomic ration of Ti, Ca, Hf therein being approximately 1:1:3 and the oxygen being present in the amount necessary to form the highest oxides of the three metals, and said calcining being for a period of at least 3 hours at 800°C.

3,870,789

ENHANCEMENT OF MORPHOLOGIC DETAIL IN TISSUE

Kurt W. Mikat, 6061 Rolling Green, Grand Blanc, Mich. 48439

Filed Dec. 1, 1972, Ser. No. 311,349

Int. Cl. G01n *1/00, 1/30;* **G02b** *21/34*

U.S. Cl. 424—3 **7 Claims**

1. A method for preparing a tissue for microscopic examination said tissue having intercellular connective matter, said method comprising the steps of subjecting said tissue to a centrifugal force of sufficient magnitude and duration to flatten the cells of said tissue and simultaneously treating said tissue with a tissue fixative to prevent, following such centrifugation, said flattened cells from reverting significantly toward their original shape.

3,870,790

SOLID PHARMACEUTICAL FORMULATIONS CONTAINING HYDROXYPROPYL METHYL CELLULOSE

Hans Lowey, Mamaroneck, and Herbert Henry Stafford, Staten Island, both of N.Y., assignors to Forest Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 5,140, Jan. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 626.968, March 30, 1967, abandoned. This application Oct. 25, 1972, Ser. No. 300,745

Int. Cl. A61k *17/00, 21/00, 27/00*

U.S. Cl. 424—19 **3 Claims**

1. A method of preparing a long-acting compressed buccal composition for the administration of transmucosally absorbed therapeutic agents consisting essentially of the therapeutic agent and a carrier which comprises subjecting an effective amount of a dry carrier consisting of from 80 to 100% of hydroxypropyl methyl cellulose having a methoxyl content of 28 to 30% and a hydroxypropyl content of 7 to 12% and from 20 to 0% of ethyl cellulose having an ethoxy content of 48 to 49.5% to controlled humidity for a time sufficient to establish a moisture content of from about 5 to about 25%, mixing the moisturized carrier with a therapeutically effective amount of the therapeutic agent and compressing the mixture into solid shaped units at a pressure of from about 5 to about 8 pounds per square inch.

3,870,791

SOLID STATE OPHTHALMIC MEDICATION DELIVERY METHOD

Heskel M. Haddad, 1200 Fifth Ave., New York, N.Y. 10029, and Spiro P. Loucas, 16 Toni Ct., Plainview, N.Y. 11803

Continuation of Ser. No. 246,661, April 24, 1972,. This application Jan. 22, 1974, Ser. No. 435,475

Int. Cl. A61k 27/12

U.S. Cl. 424—22 13 Claims

1. A complete ophthalmic dosage of medicament in solid form for insertion into the cul-de-sac of the eye between the eyeball and lid to dispense the medicament to the eye over a prolonged period and leave the cul-de-sac free from tear insoluble residue, comprising a solid matrix of a non-irritating pharmacologically acceptable polyuronic acid or carboxymethylcellulose salt of a medicament, said matrix adapted to form a gel-matrix after insertion into the cul-de-sac to slowly diffuse said dosage of medicament to the eyeball, said matrix being free from tear insoluble carriers.

3,870,792

CERTAIN DIHYDROPHTHALIZINES FOR TREATING HEMORRHAGE AND THROMBOSIS

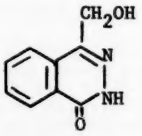
Michiro Inoue, 26-3, 6-chome, Kokuryo-cho, Tokyo; Masayuki Ishikawa, 14-13, 3-chome, Akazutsumi, Setagaya-ku, Tokyo; Takashi Tsuchiya, 13, Kitamachi, Shinjuku-ku, Tokyo, and Takio Shimamoto, 17-25, 5-chome, Minamikoiwa, Edogawa-ku, Tokyo, all of Japan

Division of Ser. No. 274,512, July 24, 1972, Pat. No. 3,840,662. This application Aug. 10, 1973, Ser. No. 387,297

Int. Cl. A61k 27/00

U.S. Cl. 424—250 2 Claims

1. A method of treating cerebral thrombosis which comprises administering to a human patient suffering therefrom an effective amount of the compound of the following formula



or a pharmaceutically acceptable inorganic acid salt thereof in a dose of 1 to 100 mg/kg body weight/day.

3,870,793

ANIMAL FEED AND PROCESS

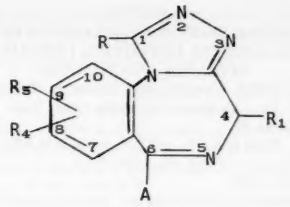
Robert J. Collins, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 170,328, Aug. 9, 1971, abandoned. This application Aug. 6, 1973, Ser. No. 385,909

Int. Cl. A61k 27/00

U.S. Cl. 424—269 6 Claims

1. A process for obtaining increased meat, milk or egg production comprising the feeding of from about 0.01 to about 250 mg./day of a compound selected from the group consisting of 1,6-disubstituted-4H-s-triazolo[4,3-a] [1,4]benzodiazepine of the formula:



wherein R is a cycloalkyl of 3 to 8 carbon atoms, inclusive, wherein R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, hydroxy or acetoxy wherein A is selected from the group consisting of cycloalkyl in which the ring consists of 5 to 7 carbon atoms, inclusive, and

in which R_2 and R_3 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, trifluoromethyl and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, amino, dialkylamino, and alkanoylamino, in which the carbon moieties are of 1 to 3 carbon atoms, inclusive; pyridyl (2, 3, or 4) and pyrimidyl; wherein R_4 and R_5 are defined like R_2 and R_3; the 5 N-oxides thereof and a pharmacologically acceptable salt thereof in combination with the nutrient feed to a healthy meat-producing, milk-producing or egg-laying animal.

3,870,794

TREATMENT OF CERTAIN EMOTIONAL DISORDERS WITH NICOTINE COMPOUNDS

Ronald R. Hutchinson, Augusta; Grace S. Emley, Ross Township, Kalamazoo County; Edward R. Hallin, Barry Township, Barry County, and Nancy J. Murray, Charlestown Township, Kalamazoo, all of Mich., assignors to Foundation for Behavioral Research, Kalamazoo County, Mich.

Filed Feb. 20, 1974, Ser. No. 444,035

Int. Cl. A61l 27/00

U.S. Cl. 424—264 8 Claims

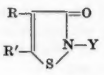
1. A method of producing (A) reduction of anger, hostility, irritability, frustration and the behavioral expression of these emotions, without producing general depression, drowsiness or sedation, or (B) reduction of fear, anxiety, nervousness and the behavioral expression of these emotions, with the simultaneous increase in focus upon and performance of necessary tasks, in mammals requiring such treatment, which comprises administering to such a mammal a unit dosage form of a therapeutic composition containing an effective, non-toxic amount of nicotine, pharmaceutically acceptable acid addition salt of nicotine, nornicotine or cotinine, with a pharmaceutically acceptable carrier, diluent or vehicle.

3,870,795
STABILIZATION OF SOLUTIONS OF 3-ISOTHIAZOLONES EMPLOYING CERTAIN METAL NITRATES AND NITRITES

George A. Miller, Glenside, and Ernest D. Weiler, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 28, 1973, Ser. No. 336,659
Int. Cl. A01n 9/12
U.S. Cl. 424—270 8 Claims

1. A method of stabilizing an aqueous or polar organic solvent solution containing a microbiocidal 3-isothiazolone against chemical decomposition of the 3-isothiazolone wherein the 3-isothiazolone has the formula



wherein

Y is a hydrogen atom, an alkyl group of 1 to 18 carbon atoms, an alkenyl or alkynyl group of 2 to 18 carbon atoms, a cycloalkyl group of 3 to 12 carbon atoms having a 3 to 8 carbon atom ring, an aralkyl group of up to 10 carbon atoms, or an aryl group of up to 10 carbon atoms; R is a hydrogen atom, a halogen atom, or a (C_1-C_4) alkyl group; and

R′ is a hydrogen atom, a halogen atom, or a C_1-C_4) alkyl group or

R and R′ can be taken together to complete a benzene ring; which comprises incorporating in the solution a stabilizing amount of a metal salt selected from the group consisting of metal nitrates, metal nitrites and mixtures thereof, wherein the metal is selected from the group consisting of sodium, potassium, calcium, magnesium, copper, iron, nickel, zinc, barium, manganese, silver, and cobalt.

3,870,796
PHARMACEUTICAL PREPARATION

Alfred Hunger, Basle, and Hans-Jochen Janssen, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 201,548, Nov. 23, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,285
Claims priority, application Switzerland, Nov. 27, 1970, 17597/70
Int. Cl. A61k 27/00
U.S. Cl. 424—330 1 Claim

1. A pharmaceutical preparation which contains, by weight, 2-5 parts of 9-(γ-methylaminopropyl)-9,10-dihydro-9,10-ethano-anthracene-hydrochloride per part of 9-(methylaminomethyl)-9,10-dihydro-9,10-ethano-anthracene-hydrochloride together with a pharmaceutical carrier.

3,870,797
ANESTHETIC HALOGENATED CYCLOBUTANES

Robert S. Holdsworth; Gerald Joseph O'Neill, both of Arlington, and Charles William Simons, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass., by said Simons

Continuation-in-part of Ser. No. 170,280, Ser. No. 170,331, and Ser. No. 170,293, all Aug. 9, 1971, said Ser. No. 170,280 is a Continuation-in-part of Ser. No. 91,521, Nov. 20, 1970, and said Ser. No. 170,331 is a Continuation-in-part of Ser. No. 93,437, Nov. 27, 1970 and Ser. No. 141,934, May 10, 1971, all abandoned.
Int. Cl. A61k 27/00
U.S. Cl. 424—352 14 Claims

1. The process of inducing anesthesia in a mammal which comprises administering by inhalation to said mammal an effective quantity for inducing anesthesia of a cyclobutane selected from the group consisting of 1-chloro-1,2,2-trifluorocyclobutane, 1,4-dichloro-1,2,2-trifluorocyclobutane, 1-chloro-1,2,2,4-tetrafluorocyclobutane, 1,4-dichloro-1,2,2,4-tetrafluorocyclobutane, 1-chloro-2,2,3,3-tetrafluorocyclobutane, 1,2,2,3,3-pentafluorocyclobutane, 1-chloro-1,2,2,3,3-pentafluorocyclobutane, 1,2,2-trifluorocyclobutane, 1-chloro-2,3,3-trifluorocyclobutane, 1-chloro-2,4,4-trifluorocyclobutane, 1-bromo-1,2,2-trifluorocyclobutane, 1-bromo-2-methyl-1,4,4-trifluorocyclobutane and 1-bromo-2-chloro-1,4,4-trifluorocyclobutane.

3,870,798
PROCESS FOR PRODUCING A LIVESTOCK FEED

Frank J. Hruby, 2809 Tallmadge Rd., Ravenna, Ohio 34266

Continuation-in-part of Ser. No. 70,763, now Pat. No. 3,787,583, is a continuation of Ser. No. 550,798, May 17, 1966, abandoned. This application Sept. 13, 1973, Ser. No. 397,072. The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.
Int. Cl. A23k 1/10, 1/06, 1/08
U.S. Cl. 426—53 3 Claims

1. A process of producing livestock feed from a raw garbage mass, comprising the steps of:

a. first refining said garbage mass by
   i. removing foreign, non-food, particles,
   ii. comminuting the garbage mass;
b. then batch processing the garbage mass by
   i. feeding a batch of uncooked garbage mass into a pressure tank,
   ii. adding a neutralizer to the batch in an amount sufficient to establish a substantially neutral state of the batch,
   iii. cooking the neutral batch in the pressure tank at pressure above atmospheric and at temperatures above 212° F. for a sufficient time to sterilize and liquify said batch,
   iv. thereafter cooling the batch to a temperature below 150° F.,
   v. adding a fermenting agent to the cooled batch,
   vi. then fermenting the entire liquified batch until emission of carbon dioxide substantially stops, and
   vii. introducing oxygen under pressure into the liquified batch during the fermenting step;
c. subsequently drying said fermented batch;
d. thereafter comminuting said dried batch;
e. said entire process being carried out while retaining the grease of the garbage mass.

3,870,799
DOUGH CONDITIONING COMPOSITION AND METHOD

Ralph J. Tenney, Kansas City, Mo., assignor to C. J. Patterson Company, Kansas City, Mo.

Filed Feb. 28, 1974, Ser. No. 446,717
Int. Cl. A21d 2/16
U.S. Cl. 426—62 29 Claims

1. A conditioning and softening agent for incorporation into wheat based doughs which comprises a hydrated additive containing a member selected from the group consisting of the alkali and alkaline earth metal salts of the acyl lactylates of C_{14}–C_{22} fatty acids, and a member selected from the group consisting of the ethoxylated mono- and diglycerides of C_{14}–C_{22} fatty acids, the weight ratio of said lactylate component to said glyceride component in said additive ranging from about 1:1 to 10:1.

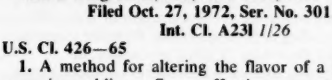
3,870,800

FOODSTUFF FLAVORED WITH 4-(METHYLTHIO)BUTANE DERIVATIVES

Alan O. Pittet, Atlantic Highlands; John V. Pascale, Jackson, both of N.J.; Stuart Patton, State College, Pa., and Michael H. Brodnitz, Matawan, N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Oct. 27, 1972, Ser. No. 301,524
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 7 Claims

1. A method for altering the flavor of a foodstuff which comprises adding a flavor effective amount of at least one 4-(methylthio)butane derivative having the formula



wherein X is hydrogen and Y is carbonyl oxygen; X is hydroxy and Y is two hydrogen atoms or a carbonyl oxygen; or X is lower alkoxy and Y is (a) carbonyl oxygen or (b) hydrogen and lower alkoxy, the alkoxy groups containing from one to three carbon atoms.

3,870,801

FLUID AQUEOUS PROTEIN COMPOSITIONS AND FOOD PRODUCTS PREPARED THEREFROM

Michael Peter Tombs, Pavenham, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 155,029, June 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 848,600, Aug. 8, 1969, abandoned. This application Mar. 19, 1973, Ser. No. 342,590
Claims priority, application Great Britain, Aug. 9, 1968, 38211/68
Int. Cl. A23j *3/00*
U.S. Cl. 426—92 15 Claims

1. A fluid aqueous protein composition comprising from about 15 to about 50% by weight of a substantially undenatured plant protein in the dissolved state, and a dissolved water-soluble edible salt selected from the group consisting of water-soluble edible salts of sodium, potassium, ammonium, calcium and magnesium, said dissolved water-soluble edible salt having a concentration sufficient to keep the protein dissolved and to give an ionic strength (based on the water content of said composition) of at least about 0.2, the composition containing at least about 50% by weight of water and having a pH in the range of about 4 to about 6 and being capable of being coagulated by heat.

3,870,802

PACKAGING NITRILE CONTAINING RESINS

Alva F. Harris, and Peter Shapras, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 15, 1973, Ser. No. 323,771
Int. Cl. C08f *37/00*, *27/18*
U.S. Cl. 426—106 33 Claims

1. In the process for preparing shaped packaging materials for foods, beverages and related substances from nitrile polymers containing from 55 to 85% by weight, based on the total polymer weight, of a nitrile monomer unit selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile wherein the methacrylonitrile is present in amounts of up to 16% by weight based on the total polymer weight, which process involves at least one forming operation comprising heating the polymer in an essentially solvent free condition to a molten state and shaping the polymer into a packaging material, the improvement which comprises having a formaldehyde compound in intimate contact with the nitrile polymer before or during at least one of the forming operations wherein the polymer is heated to a molten state, said formaldehyde compound being employed in an amount sufficient to provide a shaped packaging material having an extractable HCN content below 50 parts per billion.

3,870,803

INSTANT STUFFING MIX

Ruth M. Siems; Anthony C. Capossela, Jr., both of Tarrytown, N.Y.; John F. Halligan, Old Greenwich, Conn., and C. Robert Wyss, Scarsdale, N.Y., assignors to General Foods Corporation, White Plain, N.Y.

Filed July 16, 1971, Ser. No. 163,437
Int. Cl. B65d *85/00*
U.S. Cl. 426—128 3 Claims

1. A conveniently packaged stuffing mix for ready hydration to form a stuffing composition comprising:

i. a stuffing flavor component comprising a mixture of condiments with dehydrated vegetables or dehydrated fruits or mixtures of said vegetables or fruits, and

ii. a low moisture content farinaceous crumb component, said crumb having a moisture content of less than 15% and comprising a member selected from the group consisting of

a. yeast-leavened corn bread crumb,

b. mixtures of yeast-leavened white bread crumb with corn bread crumb or yeast-leavened whole wheat bread crumb or mixtures thereof, and

c. mixtures of corn bread crumb with yeast-leavened whole wheat crumb or yeast-leavened corn bread crumb or mixtures thereof, and

said crumb having a particle size such that at least 95% by weight passes through a 2 mesh screen and no greater than 5% by weight passes through a 50 mesh screen,

each of said components being packaged separately to form a segregated unit package.

3,870,804

PREPARATION OF FRIED PARBOILED RICE AND THE RESULTING PRODUCT

Ray C. Tolson, Sr., 1720 W. Miramonte Dr., Woodland, Calif. 95695, and Ray C. Tolson, Jr., Rt. 1, Box 165, Harold, Calif. 95638

Continuation-in-part of Ser. No. 293,077, Sept. 28, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,580
Int. Cl. A23l *1/18*
U.S. Cl. 426—141 4 Claims

1. A method for producing a partially expanded edible rice product comprising the steps of:

parboiling rough unhulled rice kernels;

drying said rice kernels back to about their original, as harvested, moisture content;

milling the dried parboiled rice kernels to remove the rough outer hull and outer bran layer, and to smooth the kernels;

frying the milled kernels in an edible oil at a temperature of from about 350° to about 410°F. for from about 5 to about 20 seconds to produce a partially expanded product;

separating the fried kernels from the oil and removing excess oil from the surface of the kernels; and

cooling the fried kernels.

3,870,805

PROCESS FOR PREPARING TEXTURIZED PROTEIN COMPOSITIONS AND THE RESULTING PRODUCT

Lester P. Hayes, Decatur; John W. Robinson, Blue Mound; Ross P. Simms, Decatur, and Millard E. Russell, Blue Mound, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 4, 1970, Ser. No. 86,908
Int. Cl. A23l *1/36*
U.S. Cl. 426—148 25 Claims

1. A method of preparing shredded protein products pos-

sessing an improved meat-like texture from hydrated protein extrudates, said method comprising the steps of:

a. providing a plurality of hydrated extrudate pieces, characterized as containing on a solid weight basis a minor amount of water-soluble carbohydrates and protein as a principal constituent, said extrudates being further characterized as individually comprising a cellular, reticulated structure of a multiplicity of fibers bonded to one another, said fibers being enshrouded by a matrix of water soluble constituents with a plurality of pores and channels communicating within said matrix, the pores and channels being oriented predominantly in juxtaposition to the fibers and separated from one another by cellular walls comprised of said fibers and said matrix of water-soluble constituents, and

b. subjecting the hydrated extrudate pieces to a shredding force sufficient to rupture and split the hydrated extrudate pieces predominantly along the longitudinal axis of said hydrated extrudate pieces and thereby provide a plurality of fragments of a substantially lesser cross-sectional diameter than the hydrated extrudate pieces.

3,870,806

METHOD FOR IMPROVING TEXTURE OF BREAD/BREAD CRUMBS

Anthony C. Capossela, Tarrytown; Michael T. McGuire, Elmhurst; Gordon C. Smith, Congers, and Joseph D. Albaum, Pleasantville, all of N.Y., assignors to General Foods Corporation, White Plain, N.Y.

Filed Aug. 16, 1972, Ser. No. 281,099

Int. Cl. A21d *13/00*

U.S. Cl. 426—152 **8 Claims**

1. A process for conditioning continuous process bread to render it suitable for use as crumb in a stuffing mix for hydration to form a stuffing composition comprising subjecting continuous process bread slices or pieces to a temperature within the range of 200° to 375°F. for a period of time sufficient to strengthen the cellular structure of the bread without causing toasting and excessive browning and sufficient to reduce the moisture content of the bread to below about 10 percent by weight, and grinding and screening said bread to form a crumb having a particle size such that at least about 95 percent by weight passes through a 2 mesh screen and no greater than about 5 percent by weight passes through a 50 mesh screen.

3,870,807

PROCESS FOR MANUFACTURE OF EDIBLE, FLOWABLE SUSPENSIONS OR SOLID GLYCERIDES IN LIQUID GLYCERIDES OR MIXTURES OF LIQUID AND SOLID GLYCERIDES AND PRODUCTS OBTAINED THEREBY

Josef Baltes, Sendenhorst, Germany, assignor to Harburger, Oelwerke, Brinckman & Mergell, Hamburg, Germany

Filed Aug. 18, 1971, Ser. No. 172,926

Claims priority, application Germany, Aug. 31, 1970, 2043084

Int. Cl. A23d *5/02, 3/02;* **C11c** *3/10*

U.S. Cl. 426—194 **13 Claims**

1. A process for the manufacture of at least one of (ii) edible, flowable suspensions of solid glycerides in liquid glycerides, and (iii) mixtures of liquid and solid glycerides, which mixtures are suitable for the manufacture of margarine, which process comprises:

1a. hydrogenating soya oil with a nickel contact catalyst, at 110° to 150° C., to an iodine number of 90 to 115;

b. subjecting the hydrogenated soya oil to controlled transesterification with a trans-esterification catalyst at 25° to 30° C., to produce higher-melting triglycerides; and

c. fractionating the material from step (b) by slowing cooling it to a temperature of 0° to 10° C. and keeping it for at least 2 hours at this temperature, and then separating the solid constituents and recovering the liquid, cold-stable constituents (i); and

d. mixing the material from step (b) in about equal proportions by weight with the cold-stable oil obtained from step (c) and then cooling the mixture to a temperature of 10° to 18° C., so that the high-melting triglycerides crystallize out almost completely, and then keeping the mixture at a temperature of about 25° C. until the solid constituents have been converted into the stable crystal form, said crystal form being the β'-modification or β-modification and then cooling to produce edible, flowable suspensions, (ii) of solid glycerides in liquid glycerides; or

2a. hydrogenating soya oil with a nickel contact catalyst, at 110° to 150° C., to an iodine number of 90 to 115;

b. subjecting the hydrogenated soya oil to controlled transesterification with a trans-esterifications catalyst at 25° to 30° C., to produce higher-melting triglycerides; and

c. fractionating the material from step (b) by slowing cooling it to a temperature of 0° to 10° C. and keeping it for at least 2 hours at this temperature, and then separating the solid constituents and recovering the liquid, cold-stable constituents (i); and

e. combining material from step (b) with solid constituents obtained from step (c) to produce glyceride mixtures (iii) suitable for the manufacture of margarine.

3,870,808

METHOD OF PRODUCING A MEAT SIMULATING TEXTURED FOOD PRODUCT

Robert A. Boyer, Creve Coeur, and John E. Middendorf, Affton, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Mar. 16, 1971, Ser. No. 124,953

Int. Cl. A23j *3/00*

U.S. Cl. 426—250 **13 Claims**

1. A method of producing a meat simulating textured food product from protein sources comprising the steps of: forming an aqueous slurry of the proteinaceous material having a solids content of about 10 – 40 percent by weight, controlling the pH of the proteinaceous slurry to between about 4 and 6, confining the proteinaceous slurry, freezing the proteinaceous slurry to form ice crystal layers in said slurry thereby compressing and molding the protein material of the slurry into layers spaced apart by the ice crystals and heat setting the protein layers into an irreversible substantially insoluble form by heating the frozen slurry to a temperature sufficiently high to allow the protein layers to irreversibly set and lower than a temperature at which the protein will degrade thereby melting the ice crystal layers to produce the meat simulating textured food products.

3,870,809

STEAMING CAUSTIC TREATED, PEELED POTATOES TO LOOSEN AND REMOVE THE EYES AND DEFECT PORTIONS THEREOF

Glen R. Green, and Jay B. Bennion, both of Ontario, Oreg., assignors to Ore-Ida Foods, Inc., Ontario, Oreg.

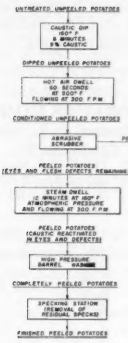
Filed Jan. 22, 1973, Ser. No. 325,618

Int. Cl. A23l *1/12*

U.S. Cl. 426—287 **4 Claims**

1. A process for peeling potatoes, comprising the steps of treating the entire surface of raw unpeeled potatoes with caustic, the strength of the caustic and the length of time it is applied to the potatoes being effective to loosen the potato skins; abrasively scrubbing the potatoes for removing the loosened skins from superficial surfaces thereof; subjecting the so-peeled potatoes still containing eyes and defective portions having residual caustic present therein to the action of steam to effect localized caustic action of said residual

caustic in said eyes and defective portions of the potatoes to loosen said eyes and defective portions; and water-flushing the thereby loosened eyes and defective portions from the otherwise peeled potatoes.



3,870,810

INHIBITING BEER GUSHING

Anthony Martin Humphrey, Ickenham, Uxbridge, England, assignor to Bush Boake Allen Limited, London, England

Filed Mar. 9, 1973, Ser. No. 339,679

Claims priority, application Great Britain, Mar. 9, 1972, 11077/72

Int. Cl. C12h *1/12;* **C12c** *9/02*

U.S. Cl. 426—329 **10 Claims**

1. A method for reducing the tendency of beer to gush which comprises admixing with said beer an unsaturated fatty acid having from 10-20 carbon atoms in a proportion of from 1-20 percent based on the weight of iso-α-acids in the finished beer.

3,870,811

PROCESSES FOR THE PRODUCTION OF PROTEIN-RICH FOODSTUFFS FROM NATURAL PROTEIN-CONTAINING FOODS THAT ARE SUBJECT TO SYNERESIS

Max Erich Schulz, Ascheberg, Germany, assignor to Gervais-Danone AG, Munich, Germany

Continuation-in-part of Ser. No. 254,794, April 17, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,688

Claims priority, application Germany, Apr. 16, 1971, 2118532

Int. Cl. A23j *3/00;* **A23l** *1/00*

U.S. Cl. 426—348 **10 Claims**

1. A process for producing a foodstuff containing a high content of protein in the form of a cake or loaf that can be cut into firm slices and which can be further cooked by boiling, baking, roasting, sauteeing, or deep frying without crumbling which comprises preparing an intimate mixture consisting essentially of an albumin or globulin and a water-containing natural protein-containing food that is subject to syneresis of the group consisting of milk curds containing casein, milk curd coprecipitates containing casein and lactalbumin, whey protein, fresh and ripened cheeses, and soybean curd, in which mixture the ratio of albumin or globumin or globulin to the other protein which show syneresis, on a dry-weight basis is between 20:80 and 50:50, placing the same mixture into a mold or container and heating the mixture therein at a temperature between 80 and 100°C for a period between 5 and 60 minutes.

3,870,812

PROTEIN GEL MODIFICATION

John T. Hayes, Jr., North Tarrytown, and William E. Marshall, Mount Kisco, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 25,284, April 2, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,104

Int. Cl. A23j *3/00*

U.S. Cl. 426—350 **4 Claims**

1. A method for making a gelled protein food product having a softer and controlled texture comprising:

a. mixing vegetable protein isolate prepared by precipitating protein at about the iso-electric point of the protein with a major amount of water to produce an aqueous dispersion of protein isolate in water,

b. said dispersed isolate being present in an amount effective to form a thermally irreversible gel upon autoclaving,

c. said dispersion further containing an effective amount of a disulfide bond breaking agent sufficient to control and reduce the viscosity of the aqueous dispersion and effective to give a softer gel after autoclaving,

d. adjusting the pH of the dispersion to about 5.0 to about 8.0,

e. encasing the reduced viscosity dispersion to shape the dispersion,

f. autoclaving the shaped reduced viscosity dispersion at a temperature and for a time period sufficient to produce a stable, thermally irreversible gel, said gel being softer than that obtained without treatment of the isolate with disulfide bond breaking agent.

3,870,813

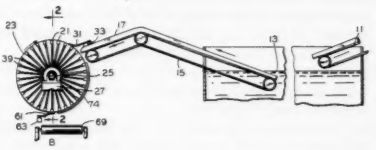
TWO STAGE INTERIOR-EXTERIOR BLANCHING PROCESS

William F. Filz, Portland, Oreg., assignor to North Pacific Canners & Packers, Inc., Portland, Oreg.

Division of Ser. No. 271,243, July 13, 1972, Pat. No. 3,804,000, which is a division of Ser. No. 83,767, Oct. 26, 1970, Pat. No. 3,707,384. This application Jan. 25, 1974, Ser. No. 436,528

Int. Cl. A23l *1/00*

U.S. Cl. 426—509 **1 Claim**



1. The method of blanching an ear of corn having an uncored pith portion comprising:

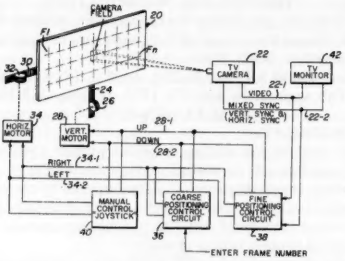
subjecting the ear of corn to two independent blanching steps, one of which comprises applying a hot fluid to the exterior of an ear for a sufficient time to blanch the kernels without blanching the cob portion of the ear,

and the other blanching step comprising at another time, independently of the said one blanching step, injecting a hot fluid under pressure into the pithy cob portion of the ear to blanch that portion of the ear.

3,870,814
IMAGE POSITIONING APPARATUS AND METHOD

Thomas H. Woods, Middletown, and William M. Voss, Martin, both of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Sept. 11, 1973, Ser. No. 396,190
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **8 Claims**



1. Apparatus for viewing and positioning an object having sensible material thereon, including at least a rectangular reference mark of predetermined length and width, comprising:

a camera having a field of view repeatedly scanned along successive lines parallel to said mark length and spaced from each other in the direction of said mark width, said mark width being greater than twice the spacing between adjacent scan lines, said successive scanning of said lines being at a specified line scan rate,

said camera including means providing a) a video output signal representing sensible material transduced by said camera during said scanning, b) successive line sync signals synchronized with scans of successive lines of said field, and c) successive field sync signals synchronized with successive scans of said field,

means responsive to said video and sync signals for visually displaying said sensible material transduced by said camera during said scanning,

clock means for generating clock signals at a rate substantially in excess of said specified line scan rate,

means responsive to said video, clock, and line sync signals for detecting traversal of said mark during scanning of a line, said means including a first counter under control of said video and line sync signals which counts the clock signals occurring during scanning traversal of a mark in a single line and producing a mark traversal signal when said first counter achieves a specified clock count condition,

a second counter for counting said mark traversal signals occurringduring scanning of said field to determine the number of occurring during in which said mark was traversed during scanning of said field,

means responsive to said second counter for generating a mark sensed signal when said second counter achieves a specified count condition,

third counting means reset by said line sync signals and responsive to said clock signals and said mark sensed signals for determining a first actual coordinate position of a specified point of said mark in the direction of said mark length,

fourth counting means reset by said field sync signals and responsive to said line sync signals and said mark sensed signals for determining a second actual coordinate position of said specified point of said mark in the direction of said mark width,

means responsive to said third and fourth counters for comparing said actual coordinate positions of said specified point of said mark against desired coordinate positions and in response thereto generating length-directed and width-directed repositioning signals correlated to the differences between said actual coordinate positions and said desired coordinate positions,

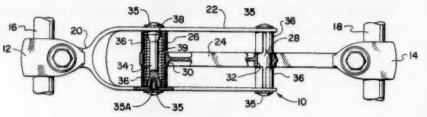
and

motor means responsive to said length-directed and width-directed repositioning signals for relatively repositioning said object and camera field in said length and width directions to locate said specified point of said mark at said desired coordinate positions.

3,870,815
CONDUCTOR VIBRATION DAMPING DEVICE

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,322
Int. Cl. H02g *7/12, 7/14*
U.S. Cl. 174—42 **6 Claims**



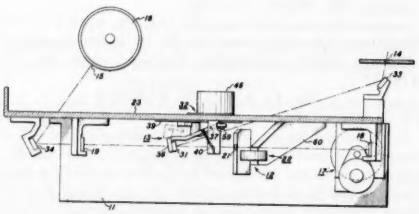
1. A conductor vibration damping device comprising a conductor clamping member and a second adjacent member, one of said members having two spaced arms spaced from and located respectively on two opposed sides of an arm of said other member,

a close wound helical spring and a rigid pin means mechanically connecting said members together, with both of said members directly engaging the pin means and being supported thereby in a manner that allows pivotal movement of at least one of the members about the pin means, and, means spacing the arm of one member from the spaced arms of the other member, the longitudinal axes of the spring and pin means extending between the spaced arms of the one member and through the arm of the other member in a direction substantially perpendicular thereto, and at spaced apart locations therealong.

3,870,816
OPTICAL SYSTEM FOR TRANSMIT/RECEIVE MODE CONDITIONING OF FACSIMILE TRANSCEIVERS

Peter John Mason, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 17, 1973, Ser. No. 361,388
Int. Cl. H04n *1/42*
U.S. Cl. 178—7.6 **9 Claims**



5. In an apparatus having means for supplying a beam of collimated light along a given path, first deflecting means located in said path to receive said beam thereon and for cyclically sweeping said beam through a predetermined scan angle, spaced apart line-like scanning and printing stations,

said first deflecting means being optically located between said stations and said beam supplying means, one of said stations being located in the normal path of said cyclically sweeping beam and the other of said stations being located out of the normal path of said cyclically sweeping beam, second deflecting means optically located between said stations and said first deflecting means, means for moving said second deflecting means into a deflecting position in the normal path of said cyclically sweeping beam to intercept said sweeping beam and deflect the same to the other of said stations and for moving the same out of said deflecting position to a beam passing position to allow said sweeping beam to reach said one station, whereby said apparatus is conditioned for either scanning or printing.

3,870,817

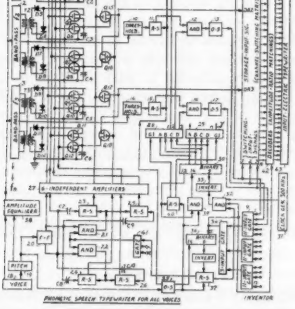
PHONETIC SOUND RECOGNIZER FOR ALL VOICES

Meguer V. Kalfaian, 962 Hyperion Ave., Los Angeles, Calif. 90029

Continuation of Ser. No. 209,661, Dec. 20, 1971, abandoned. This application June 8, 1973, Ser. No. 368,264

Int. Cl. G01l *1/00*

U.S. Cl. 179—1 SA **3 Claims**



1. In complex sound waves wherein the information is contained within the time periods of trains of waves, and said information is represented by the frequency and amplitude ratios between a group of resonances in each train of the complex wave, but wherein spectral variations occur, for different voices, the system for detecting and storing the peak amplitudes of said group of resonances during the time periods of said trains successively, adaptable to stored-signal regrouping as a representation of normalyzing said spectral variations, and analyzing the amplitude ratios between said regrouped signals, said system comprising a plurality of bandpass filters to separate the voice signal's peak amplitude resonances into corresponding channels, each filter output feeding a parallel-pair of channels of detector/gate/storage/ discharge and mixer-gate channels to a common gated mixer output, said parallel pair of detector channels for alternate switching and storage of the filter output, where a plurality of detector means for detecting and storing the peak ampltudes of the resonances in said complex wave, each detector means consisting of a first pair of storage means for alternate storage of said detected signals, a second pair of discharging means for said storages, and a third pair of mixing means for said stored signals to a common output terminal; means for producing undirectional timing pulses at the frequency rate of said trains; a flip-flop (block **20**), and means for operating it by said unidirectional timing pulses for producing alternate steady state output signals at the rate of said trains; coupling means from said steady state signals to said first pair of storage means alternately for effecting alternate signal storages of the detected peaks of said resonances during the successive time periods of said trains; normally inoperative A and B AND-gates (blocks **21, 22**); parallel connections of the first inputs of said A and B AND-gates; direct coupling means from said steady state signals alternately to the second inputs of said A and B AND-gates; a one-shot (block **35**) having operating time period not longer than the shortest time period that occurs during said trains; coupling means from said one-shot to said parallel connected first inputs of said A and B AND-gates; coupling means from said unidirectional timing pulses to said one-shot for operation, whereby operating said A and B AND-gates alternately during the first time portions of said trains; means for deriving alternate timing pulses (from block **20**) at the frequency rate of said trains; first, second and third, fourth set-reset flip-flops (R-S blocks **23, 24** and **25, 26**), each flip-flop having set and reset inputs and set and reset outputs, respectively; A parallel coupling means of the set input of the first flip-flop with that of the reset input of said fourth flip-flop, and B parallel coupling means of the set input of the second flip-flop with that of the reset input of the third flip-flop; means for applying said alternate timing pulses to said A and B coupling means alternately, whereby effecting operation of the first and second flip-flops in alternate set states during the operating time periods of said one-shot, and operation of the third and fourth flip-flops in alternate reset states during quiescence of said one-shot; and coupling means from the set outputs of said first and second flip-flops to said third pair of mixing means, and the reset outputs of said third and fourth flip-flops to said second pair of discharging means, for effecting storages of the detected signals of said common outputs, adaptable to said spectral normalization and analysis of said amplitude ratios.

3,870,818

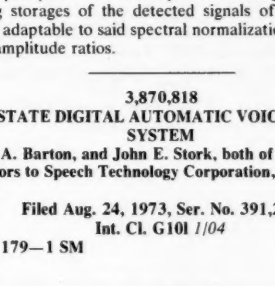
SOLID STATE DIGITAL AUTOMATIC VOICE RESPONSE SYSTEM

William A. Barton, and John E. Stork, both of Malibu, Calif., assignors to Speech Technology Corporation, Santa Monica, Calif.

Filed Aug. 24, 1973, Ser. No. 391,297

Int. Cl. G10l *1/04*

U.S. Cl. 179—1 SM **2 Claims**



2. In a signaling system for providing an automatic voice announcement of a condition being monitored, which system includes a plurality of transducers each of which is adapted to produce a signal above a distinct threshold voltage level when a corresponding condition being monitored occurs, and which system also includes permanent word message storage means, a speech synthesizer responsive to signals generated from the storage means for generating a word message, and a loud speaker for announcing the word message, the improvement comprising: sequential sampling means for sampling the outputs of said transducers in sequence;

clock pulse generating means for driving said sequential sampling means;

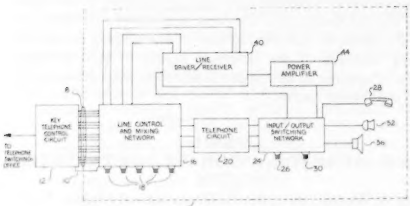
gating means controlled by said sequential sampling means for initiating the generation by the storage means of signals representing the word message corresponding to the occurrence of the condition being monitored by a particular transducer; and

additional gating means controlled by said sequential sampling means for selectively enabling said first-named gating means and for concurrently stopping the operation of said clock pulse generating means until the generation of the word message signals from said storage means has been completed.

3,870,819
CONFERENCE CALL APPARATUS FOR USE WITH KEY TELEPHONE SYSTEM EQUIPMENT

Roderick A. Dennis, 2855 S. Monaco Pky., Denver, Colo. 80222; Thomas J. Consiglio, 252 Penn, Denver, Colo. 80203, and Gerald McGowan, 4175 S. Sidney Ct., Denver, Colo. 80237

Filed Dec. 26, 1973, Ser. No. 427,715
Int. Cl. H04m *3/56*
U.S. Cl. 179—1 CN **31 Claims**



1. Conference call apparatus for use in a key telephone system which includes a key telephone control circuit, the conference call apparatus including

a mixing network,

a plurality of telephone lines coupling the mixing network to the key telephone circuit,

a telephone set coupled to the mixing network and including a transmitter and receiver and dialing apparatus, and line driver and receiver circuity coupled to the mixing network and to the telephone set,

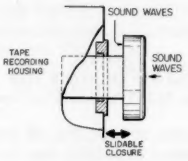
said mixing network including first and second transformers, each coupled to the line driver and receiver circuitry, a plurality of impedance means, and switch means for selectively coupling each of said telephone lines to said first transformer and for selectively coupling each of said impedance means to said second transformer so that the impedance presented by said second transformer to the line driver and receiver circuitry is substantially the same as the impedance presented by said first transformer to the line driver and receiver circuitry, and

said line driver and receiver circuitry including means for applying to the receiver of said telephone set signals induced on said first transformer by voice signals transmitted over the telephone lines coupled to the first transformer, and means for applying to said first transformer signals from the transmitter of said telephone set to thereby induce corresponding signals on each of the telephone lines coupled to said first transformer.

3,870,820
MICROPHONE WITH DIFFERENT DIRECTIONAL MODES

Tomohide Suzuki, and Toshio Aoki, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed June 29, 1973, Ser. No. 374,870
Claims priority, application Japan, June 30, 1972, 47-77450; June 30, 1972, 47-77451; June 30, 1972, 47-77452
Int. Cl. H04r *1/38*
U.S. Cl. 179—1 DM **2 Claims**

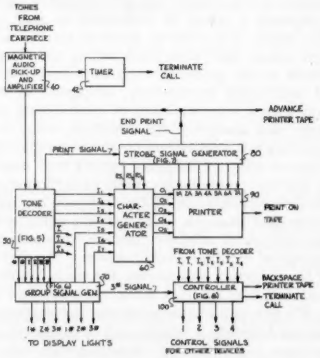


1. In combination, a recording apparatus having a casing and a microphone having a housing with a larger diameter portion and a smaller diameter portion defining a shoulder portion therebetween, said apparatus casing having an opening receiving said smaller diameter portion slidably movable with respect to said casing, said shoulder portion having at least a first opening therein, a diaphragm mounted in said larger diameter portion of said housing and having a first major surface exposed to frontal soundwaves and a backside second major surface opposite to said first major surface, a sensor operatively coupled to said diaphragm, a backplate mounted in said larger diameter portion spaced from said second surface of said diaphragm and defining a space between it and said shoulder, said backplate having therein at least a second opening communicating with said first opening through said space, whereby upon slidable movement of said smaller diameter portion away from said apparatus casing said second opening is uncovered and soundwaves impinge on said second surface through said first and second openings.

3,870,821
PUSHBUTTON TELEPHONE PRINTER/RECORDER

Donald P. Steury, 9380 S.W. Lake St., Tigard, Oreg.

Filed Nov. 29, 1972, Ser. No. 310,236
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **6 Claims**



1. An attachment apparatus for use in transmitting messages by a pushbutton-type tone-signalling telephone having numeric keys and non-numeric keys, each key when actuated

generating respectively distinct audio-frequency tone signals, comprising:

a. converter means for receiving and converting said audio-frequency tone signals generated by said message sending telephone into corresponding distinct electrical signals;

b. selector means coupled to said converter means for responding to those of said electrical signals which correspond to transmitted tone signals generated by actuation of a non-numeric key on said sending telephone, said selector means selecting among a plurality of character grouping modes and generating signals representative of the particular mode selected, wherein at least one of said non-numeric keys has assigned thereto more than one character grouping mode of said plurality of character grouping modes; and

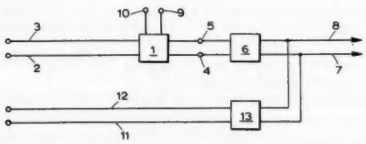
c. display means coupled to said selector means and responsive to said mode selection signals for visually indicating which particular one of said character grouping modes of the plurality of character grouping modes assigned to a respective non-numeric key, has been selected as well as indicating the characters comprising said selected character grouping mode.

3,870,822

SUPPLYING A CHARGING CURRENT BY WAY OF TELEPHONE LINES OR THE LIKE

Oliver Charles Matthews, Edgware, England, assignor to The Post Office, London, England

Filed Feb. 14, 1972, Ser. No. 225,902
Int. Cl. H04m *11/06*
U.S. Cl. 179—4 **8 Claims**



1. A power supply system for supplying current from an electrical direct current power source to an auxiliary load at a remote location by way of a telecommunication transmission line, said system including a power transmit unit and a line power receiver unit situated at the location remote from the transmit unit; said transmit unit including first means to sense the state of communication and to connect, and to disconnect, the power source to, and from, the line, when the line is idle, and busy, respectively, said connection being made at the end of a first predetermined time interval from the line becoming idle, and said disconnection being made when the line is busied; and, said receiver unit including second means to sense the idle, and busy state of communication, and arranged to connect the load to the line when the line is idle and to cause the current from the power source to flow at the end of a second predetermined time interval from the line becoming idle, and said second means being arranged to disconnect the load from the line when the line is busied and required as a telecommunication link.

3,870,823

TELEPHONE EXCHANGE METERING SYSTEM

Winston D. Gayler, Mountain View, and James E. Ahern, Cupertino, both of Calif., assignors to Vidar Corporation, Mountain View, Calif.

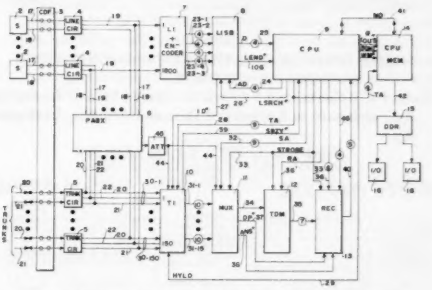
Filed Oct. 10, 1973, Ser. No. 404,873
Int. Cl. H04n *15/38*
U.S. Cl. 179—7 MM **16 Claims**

1. A message metering system for detecting and storing information concerning station usage of outgoing trunk lines, the improvement comprising,

means for addressing said trunk lines with a sample address SA,

a plurality of addressable receivers for connection when addressed to said trunk lines, each of said receivers including means to sample and analyze signals on a connected trunk line to produce output information,

means for addressing said receivers with a receiver address RA,



means for stepping said sample address SA and said receiver address RA in synchronism whereby trunk lines addressed by said sample address are sampled and analyzed by receivers addressed by said receiver address, respectively,

means for storing the information from said receivers in a memory location unique to each trunk line

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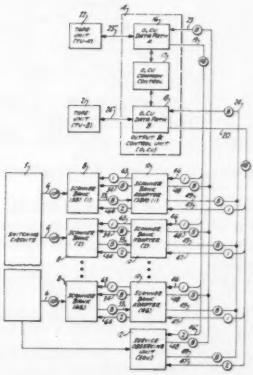
3,870,824

REDUNDANT DATA TRANSMISSION SYSTEM

James R. Baichtal, and John C. McDonald, both of Los Altos, Calif., assignors to Vidar Corporation, Mountain View, Calif.

Filed May 29, 1973, Ser. No. 365,045
Int. Cl. H04m *15/10*
U.S. Cl. 179—7 R **14 Claims**



1. A message metering system, for metering the usage of a plurality of subscribers in a telephone system where each subscriber is associated with a multi-state signal, comprising, means responsive to the addressing of each subscriber for sensing the associated multi-state subscriber signal,

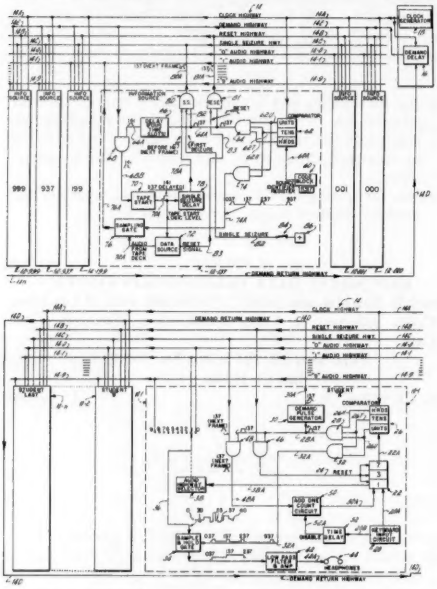
memory means having memory locations corresponding to each subscriber, said memory means concurrently addressed during the addressing of each corresponding subscriber for storing usage information derived from said multi-state signal in a memory location associated with the addressed subscriber,

first and second storage units connected to said memory means over redundant first and second data paths, respectively, where only one of said storage units and the connected data path is active while the other of said storage units and the connected data path is inactive, and first and second control network means for enabling one at a time said first and second redundant data paths, respectively.

3,870,825
TIME-DIVISION MULTIPLEX COMMUNICATION SYSTEM

Robert C Roberts, and Edward B. Alcorn, both of Lexington, Ky., assignors to Engineered Devices Company, Lexington, Ky.

Filed Jan. 5, 1973, Ser. No. 321,394
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **15 Claims**



1. A time-division multiplex communication system comprising:

at least first and second receiving stations,

at least first and second transmitting stations,

a data highway interconnecting said receiving and transmitting stations,

a calling highway interconnecting said receiving and transmitting stations,

a clock number highway interconnecting said receiving and transmitting stations,

a clock number generator for sequentially generating at least first and second different clock number signals per clock frame, said clock generator being connected to apply said clock signals to said clock highway,

first and second recognition means included in said first and second receiving stations, respectively, for recognizing receipt at said first and second receiving stations, respectively, of said first and second clock number signals,

first and second calling means included in said first and second receiving means, respectively, responsive to said first and second recognition means, respectively, for generating first and second demand signals in response to recognition by said first and second recognition means of said first and second clock number signals, said first and second calling means being connected to said calling highway to apply said first and second demand signals thereto in a specified timed relation to receipt at said first and second receiving station of said first and second clock number signals, respectively,

first and second identifier means included in said first and second transmitting stations, respectively, for recognizing receipt at said first and second transmitting stations, respectively, of said first and second clock signals, respectively, and in response thereto generating first and second outputs, respectively,

first and second calling highway sampling means included in said transmitting stations, respectively, and responsive to said first and second outputs of said first and second identifier means, respectively, for sampling said calling highway in a specified timed relation to receipt at said first and second transmitting stations of said first and second clock number signals, respectively, to detect receipt at said first and second receiving stations of said first and second demand signals, respectively,

first and second data sources at said first and second transmitting stations responsive to said first and second calling highway sampling means, respectively, for generating first and second data in response to detection of a demand signal by said first and second call highway sampling means,

first and second data gating means at said first and second transmitting stations for gating data to said data highway, generated by said first and second data sources, in specified timed relation to receipt at said first and second transmitting stations of said first and second clock signals, and

first and second data sampling means at said first and second receiving stations responsive to said first and second recognition means for sampling said data highway in predetermined timed relation to receipt at said first and second receiving means of said first and second clock number signals, respectively,

said data, calling and clock highways follow substantially the same physical path to maintain synchronism between propagation of a specified clock number signal along said clock highway and the propagation of demand and data signals associated with said specified clock number signal.

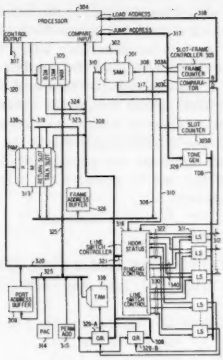
3,870,826
TONE CONTROL SYSTEM FOR A TIME DIVISION SWITCHING SYSTEM

Robert Lawrence Carbrey, Boulder; John Christian Moran, Broomfield, and Nelson Tsin Tsao-Wu, Boulder, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1973, Ser. No. 427,339
Int. Cl. H04j *3/12*
U.S. Cl. 179—15 BY **11 Claims**

1. In a time division switching system, means for assigning each call served by said system to a unique time slot in a repetitively reccurring series of time slots, a tone generator, means effective upon each occurrence of a slot for applying to said tone generator a call status word representing the current call serving state of said slot, a time division bus, and

means responsive to the reception of each status word by said generator for applying a service tone from said generator to



said bus whenever said word represents a call state that requires the application of a tone.

3,870,827
DIGITAL TIME-DIVISION MULTIPLEX SWITCHING METHOD

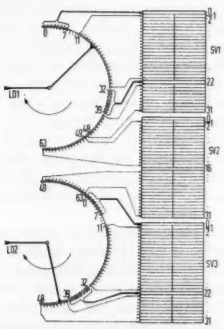
Allan Darre, Munich, and Wolf Springstubbe, Gauting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 3, 1974, Ser. No. 430,570

Claims priority, application Germany, Dec. 29, 1972, 2264179

Int. Cl. H03k *13/22*

U.S. Cl. 179—15 AP **4 Claims**



1. A method for operating pulse code modulation (PCM), time division multiplex exchange switching apparatus to connect interexchange trunks carrying delta-modulation information to PCM interexchange trunks, comprising the steps of:

combining bits of delta-modulation information in a given channel, which bits occur during the delta-modulation system periods contained within a PCM system period in an integral number equalling no more than the number of PCM bits in a PCM word,

coupling said delta-modulation bits in the order of their appearance in PCM word form to said exchange switching apparatus,

writing said delta-modulation bits into first storage locations of a storage row in a first switching storage in said exchange switching apparatus, said storage row being individually assigned to said given channel,

transferring said delta-modulation bits in PCM word form for the duration of a period when no further delta-modulation bits appear, to other locations in said assigned storage row and

if the number of delta-modulation system periods exceeds the number of half the information bits in a PCM word, transferring said delta-modulation bits to the corresponding row of a second switching storage having an identical storage capacity for retransmission therefrom as at least a portion of a PCM word.

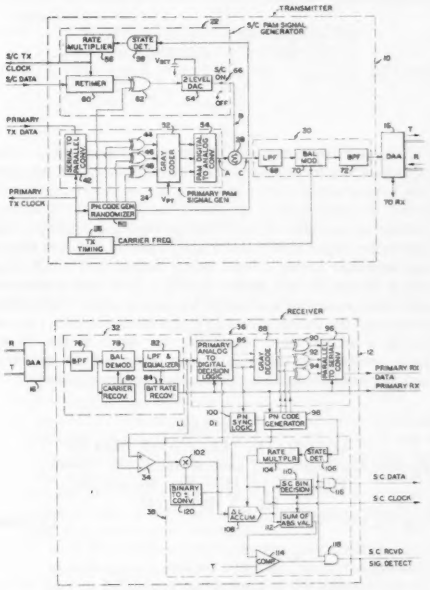
3,870,828
SUPERIMPOSED BINARY SIGNAL

Thomas V. Saliga, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Sept. 6, 1973, Ser. No. 394,766

Int. Cl. H04j *3/12*

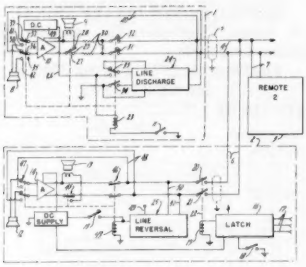
U.S. Cl. 179—15 BY **14 Claims**



1. A superimposed channel signalling device for transferring secondary channel signals simultaneously with primary channel signals: said signalling device comprising transmitter means including signal superimposing means coupled between data termainal equipment and signal transmitter means and receiver means including signal separator means coupled between data terminal equipment and signal receiver means, said signal superimposing means comprising logic means to superimpose said secondary channel signals on said primary channel signals to generate a summed channel signal for transmission by said signal transmitter means, said receiver means including decision logic means to determine the signal level of said primary channel signals, said signal separator means coupled to said decision logic means and said receiver means to receive said summed signal and said primary channel signal, said signal separator means comprising logic means to determine the magnitude of said superimposed secondary channel signals and secondary channel decision logic means coupled

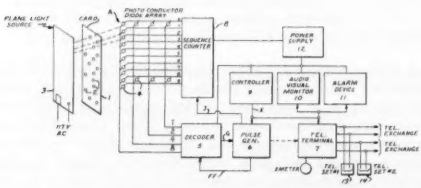
to said signal separator means, said secondary channel decision logic means including logic means to compare said secondary channel signal with a predetermined acceptance region to generate an output signal wherein said secondary channel signal is within a predetermined acceptance region.

3,870,829
AUDIO-COMMUNICATION SYSTEM HAVING A PLURALITY OF INTERCONNECTED STATIONS
Manuel Frank Chacon, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.
Filed Nov. 8, 1972, Ser. No. 304,612
Int. Cl. H04m *9/02*
U.S. Cl. 179—30 **17 Claims**



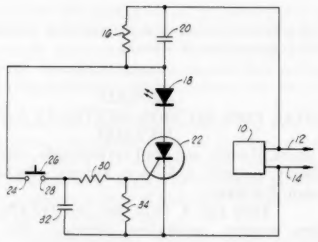
1. A multiple station audio communication system, comprising a plurality of spaced stations, a single pair of transmission lines interconnecting said stations, an audio transmitting device at each station, an audio receiving device at each station, an amplifier at each station having a relatively high impedance input means and a low impedance output means, said amplifier having a local power supply, and a talk-listen switch means at each station having a first state connecting said input means of said amplifier to said audio transmitting device and the output means to said transmission line pair and having a second state connecting the input means of said audio amplifier to said transmission lines and the output of said amplifier to the said related audio receiving device.

3,870,830
AUTOMATIC TELEPHONE DIALER
Fa-Kuei Liu Tapiei, 64-3 Lane 40 San Road, Taiwan
Filed Jan. 14, 1974, Ser. No. 432,895
Int. Cl. H04m *1/48*
U.S. Cl. 179—90 CS **12 Claims**



1. A system for automatic telephone dialing comprising: a card defining a plurality of apertures representative of dialing information; sensing means including a source of light on one side of said apertured card and an array of photoconductor elements on the other side of said card for generating sets of electrical signals in sequence and representative respectively in binary coded decimal notation of the decimal digits of the number to be dialed; decoder circuit means receiving said sets of signals for storing the same and including comparison circuit means responsive to sets of binary-coded decimal signals; pulse generator means responsive to a start signal for generating a train of dial pulse signals and for feeding said train of dial pulse signals to said comparison circuit means of said decoder means and to a telephone terminal for transmitting dial pulses, said decoder means accumulating said train of pulses and said comparison circuit means comparing the accumulated pulses with the binary-coded decimal signals from said diode array for terminating said pulse generator when the number of pulses transmitted thereby equals the number represented by said binary-coded decimal signals from said photoconductor array; and controller circuit means for initiating said pulse generator means when it is desired to dial a number, said decoder means being further responsive to the end of a dialed digit sequence to terminate the generation of dial pulses by said pulse generator and to connect the telephone line for signal communication.

3,870,831
TELEPHONE HOLD CIRCUIT
William I. McCarley, 901 24th Ave. S.W., Norman, Okla. 73069
Filed June 27, 1973, Ser. No. 375,796
Int. Cl. H04n *1/00*
U.S. Cl. 179—99 **4 Claims**



1. A telephone hold circuit for connection to a telephone line having a positive conductor and a negative conductor:
a load including a first and second terminal;
electronic switch means having an input electrode, an output electrode, and a control electrode;
visual indicator means connected in series between the first terminal of said load and the input electrode of said electronic switch means for providing visual indication when current passes therethrough;
means connecting the second terminal of said load to the positive conductor of the telephone line;
means connecting the output electrode of said electronic switch means to the negative conductor of the telephone line;
first capacitor means connected across said load; second capacitor means including two leads;
second switch means including two terminals having current passing and current blocking states;
means connecting said second switch means and said second capacitor means in series across said visual indicator means and said electronic switch means with one terminal of said second switch means being connected to the junction between said load and said visual indicator means, and with a first lead of said second capacitor means being connected to the output electrode of said electronic switch means;
actuation means coupled to said second switch means for establishing said second switch means in the current passing state whereby said second capacitor means may be charged; and
resistance means coupling the second lead of said second capacitor means to the control electrode of said electronic switch means to render said electronic switch means conductive when said second capacitor means is

charged to permit a current to pass through said load and said visual indicator means.

3,870,832

IMPLANTABLE ELECTROMAGNETIC HEARING AID

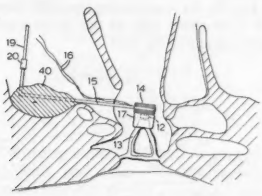
John M. Fredrickson, 24 Queen Mary's Dr., Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 364,938, May 29, 1973, abandoned. This application July 29, 1974, Ser. No. 492,675

Claims priority, application Great Britain, July 18, 1972, 33476/72

Int. Cl. H04r *25/00*

U.S. Cl. 179—107 E **10 Claims**



1. A hearing aid having certain components thereof that are implanted in the ear of the user, said hearing aid comprising sound transducer means for converting audio signals to electrical signals and electromagnetic transducer means for receiving said electrical signals and converting said electrical signals into mechanical movement of the stapes bone of the ear of the user, said electromagnetic transducer means being implantable in the ear of the user and comprising a magnet, means for firmly securing said magnet to the head of the stapes bone of the user such that said magnet and said stapes bone move as a unit without relative movement therebetween when said magnet is attracted by a magnetic field and a coil of a size that permits it to be implanted in the middle ear space of the ear of the user, said coil being adapted to be implanted in the middle ear space of the ear of the user in close proximity to said magnet, said coil when energized by said electrical signals producing a magnetic field in which said magnet is located, said coil and said magnet being positioned with respect to each other such that upon energization of said coil said stapes bone moves as a result of the interaction between the magnetic field of said magnet and said magnetic field of said coil in the same manner as said stapes bone normally is moved by the incus bone, said hearing aid also including implantable support means for said coil, said support means being adapted to be secured to a bone that holds said coil in a fixed position in said middle ear space.

3,870,833

EXPANDABLE SUSPENSION SYSTEM FOR LOUDSPEAKER BOBBIN

Showzo Kinoshita, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

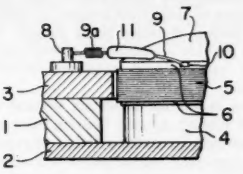
Filed May 23, 1973, Ser. No. 362,983

Claims priority, application Japan, June 20, 1972, 47-72181

Int. Cl. H04r *9/04*

U.S. Cl. 179—115.5 VC **5 Claims**

1. A loudspeaker including a cylindrical bobbin having a voice coil wound about its periphery and being suspended within a cylindrical air gap of the loudspeaker magnetic circuit which includes a fixed magnetic member, by means of a plurality of suspension wires which extend tangentially in the same direction from the outer periphery of the bobbin at equally spaced circumferential positions to the fixed magnetic member and are fixed at one end to the bobbin and at the opposite end to the fixed magnetic member, the improvement comprising: an integral, wire coil portion intermediate the ends of each wire and aligned coaxially therewith to permit the wires to expand and contract in the direction of the wire axis to diminish rotary oscillation of the bobbin during energization of the voice coil, but permitting the wire coil portion to



bend along with the remaining portion of each wire to permit axial movement of the bobbin with respect to the fixed magnetic member.

3,870,834

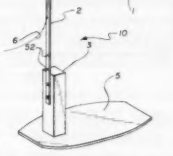
PERSONAL STEREOPHONIC SPEAKER SYSTEM

Ronald N. Yeaple, Fairport, N.Y., assignor to Yeaple Corporation, Rochester, N.Y.

Filed June 11, 1973, Ser. No. 369,069

Int. Cl. H04m *1/04*; **H04r** *1/28*

U.S. Cl. 179—146 H **11 Claims**



1. A personal loudspeaker system comprising:

a. a baffle frame,

b. near field effect means including first and second spaced opposed loudspeakers mounted on said baffle frame in cooperative relationship for deriving between said first and second loudspeakers, first and second near field effects proximal to said first and second loudspeakers respectively, in response to electrical signals applied to said first and second loudspeakers,

i. said first and second opposed loudspeakers being spaced apart to receive a listener's head therebetween so that the ears of said listener are in registry with said first and second near field effects of said first and second loudspeakers respectively, and

c. said frame having means for guiding and registering said ears of said listener with said first and second near field effects between said first and second loudspeakers.

3,870,835

STYLUS CONTROL APPARATUS FOR A VIDEO DISC RECORD PLAYER

Fredrick Roland Stave, Oaklandon, Ind., assignor to RCA Corporation, New York, N.Y.

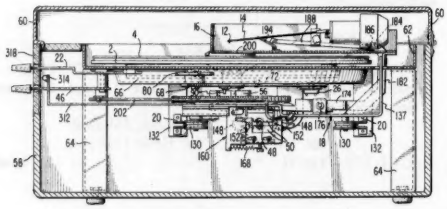
Filed Apr. 16, 1973, Ser. No. 351,600

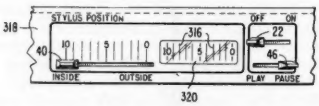
Int. Cl. G11b *17/06, 3/00*

U.S. Cl. 179—100.4 R **12 Claims**

1. In a disc record playback system including a rotatably driven turntable, apparatus for controlling cooperation of a playback stylus with a turntable-supported disc record comprising, in combination:

a stylus support housing;
an arm carrying said stylus at one end thereof;
a stylus arm pivot for coupling an end of said arm, remote from said one end, to said stylus support housing; said pivot permitting both lateral and vertical motions of said stylus relative to said stylus support housing;
said stylus support housing being subject to translatory motion to provide a translation of said stylus arm pivot permitting travel of said stylus substantially radially of said record;
stylus control means for providing vertical movement of said stylus relative to said housing between a first depressed position permitting stylus engagement with a turntable-supported record and a second elevated position precluding stylus engagement with a turntable-supported record;
first drive means coupled to said stylus support housing and selectively responsive to rotation of said turntable for





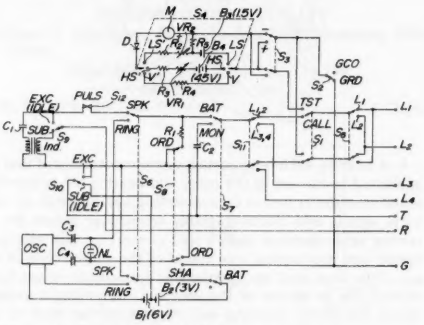
moving said stylus support housing between a standby position and a playback position;
said stylus being in vertical registry with a region of said turntable when said stylus support housing is in a playback position, and out of vertical registry with said turntable when said stylus support housing is in said standby position;
second drive means, independent of stylus-record engagement, coupled to said stylus support housing and selectively responsive to rotations of said turntable for moving said stylus support housing during playback of said record; and
selective drive control means intercoupled with said first and second drive means and said stylus control means for selectively energizing said first drive means with said stylus disposed in said elevated position and for selectively energizing said second drive means while concomitantly disposing said stylus in said depressed position.

3,870,836
PORTABLE TESTER FOR TELEPHONE SUBSCRIBER LINES

Mikio Kusama, Urawa, Japan, assignor to Daimei Tsushin Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,423
Claims priority, application Japan, Feb. 2, 1973, 48-13880
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 R **3 Claims**

1. A portable tester for telephone subscriber lines provided with subscriber line connecting terminals L_1 and L_2, further line connecting terminals L_3 and L_4, headset connecting terminals T and R and a ground wire connecting terminal G and further provided with a test circuit and a speech and ringing circuit, wherein the test circuit comprises;
a reverse key S_5 for reversing said lines L_1 and L_2,
a first test key for connecting the lines L_1 and L_2 to the test circuit or to the speech and ringing circuit,
a second test key S_3 for reversing said lines leading to a dc meter circuit,
a dc meter circuit connected to said second test key S_3 and including further switching key S_4 for switching the meter circuit including a dc meter M in either of the following three circuits of the following,
a series resistance circuit for measuring voltages between terminals of the meter circuit,
a series high dc voltate circuit for measuring insulation resistance between the terminals,
a series low voltage and low resistance circuit for measuring low resistance between the terminals,
a further key S_2 for connecting ground from the ground terminal G to either side of the meter circuit by use of said second test key S_3; and



the speech and ringing circuit comprises,
an oscillator for producing about 16–25 Hz ac ringing voltage by an excitation of housed battery,
a neon lamp shunt connected to an output circuit of the oscillator for supervising an answering condition of a called subscriber,
a key S_{11} for selectively connecting the lines L_1 and L_2 or lines L_3 and L_4 to said speech and ringing circuit,
a monitoring key S_7 for inserting a monitoring condenser of small capacitance in series with the terminals T and R for connecting a headset in order to monitor the condition of line to be tested,
a speech circuit to be fed by a local battery,
key S_9 and S_{10} for connecting said local battery to the line terminals, and
a shunt resistor inserted in parallel with the output circuit of the ringing oscillator to prevent repeated excitation of relay groups provided in the exchange.

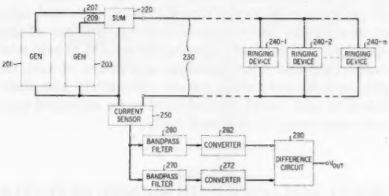
3,870,837
TELEPHONE RINGER COUNTER

John William Adams, Jamestown; Ihsan Mustafa Hasan Babaa, Greensboro, and Donald Larry Hester, Kernersville, all of N.C., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Feb. 15, 1974, Ser. No. 443,129
Int. Cl. H04m *1/24*
U.S. Cl. 179—175.2 B **9 Claims**

1. A circuit for counting ringing devices connected to a communication loop comprising first means for generating a first frequency signal; second means for generating a second frequency signal; means for coupling said first and second frequency signals to said communication loop, each ringing device comprising a resonance circuit having a resonance frequency intermediate said first and second frequencies; means connected to said communication loop for detecting a resultant communication loop signal responsive to said coupled first and second frequency signals having first and second

frequency components; means for separating said resultant first frequency component from said resultant second frequency component; means connected to said separating means for producing a third signal corresponding to said separated first frequency component and for producing a



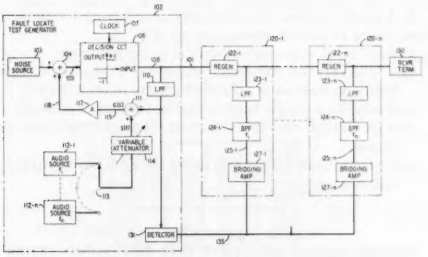
fourth signal corresponding to said separated second frequency component; and means for subtracting said fourth signal from said third signal, the output of said subtracting means corresponding to the number of ringing devices connected to said communication loop.

3,870,838

MEANS AND APPARATUS FOR FAULT LOCATING PULSE REGENERATORS

Walter Leo Corwin, Freehold; Robert Emerson Keeler, Colts Neck, and Philip Edward Rubin, Madison Township, Middlesex County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1974, Ser. No. 450,170
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.31 R **6 Claims**



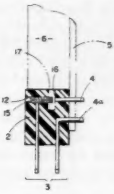
1. A method for testing a pulse regenerator comprising the steps of generating a noise voltage having random voltage fluctuations, perturbing the mean of said noise voltage in a predetermined manner, applying to said regenerator at a fixed repetition rate at test instants random sequences of successive first test pulse levels and second test pulse levels, the probability that the first test pulse level being applied at a test instant and the probability that the second test pulse level being applied at said test instant being functionally determined by the mean of the perturbed noise voltage, deriving at the pulse regenerator a response to the successively applied random test pulse levels, comparing the derived response with an anticipated response to determine whether said regenerator is faulty, said anticipated response being determined by the predetermined manner in which the mean of the noise voltage is perturbed.

3,870,839

TRAINING MODULE CONNECTOR

Clarence L. Almich, Anaheim; Jack D. Polk, Jr., Whittier, and Robert A. Aulick, Fullerton, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 20, 1973, Ser. No. 353,079
Int. Cl. H05r *1/06;* **H01b** *3/40*
U.S. Cl. 200—5 A **3 Claims**



1. A pre-faulted electrical circuit connector for use in a training device, comprising:

a. a connector body having a plurality of plug-in contact pin elements therein;

b. means forming a narrow elongated slot cut into said body from one surface thereof, said slot intersecting and cutting through a continuous number of said pin elements internally of said body to form an inoperative open circuit condition in each circuit normally connected by said intersected pins;

c. means forming a plurality of apertures in said body equal to said number of intersected pins, each said aperture having an external opening in said body different from where said slot is cut into said body surface and directed toward each of the respective said open circuits so as to communicate with both cut sides of the respective pin across said slot; and

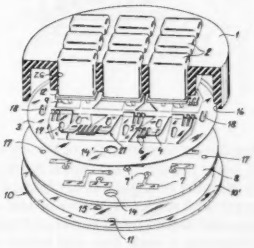
d. an adjustable conductive closure member positioned in each said aperture to selectively close or open the respective said open circuit condition.

3,870,840

SWITCH PUSHBUTTON-TYPE DIGIT KEYBOARD SWITCH WITH LEAF SPRING CONTRACT AND ACTUATOR BIASING MEANS ON COMMON CONDUCTIVE FRAME

Gianfranco Rivetta, Milan, and Egidio Marcotti, Arona, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 15, 1973, Ser. No. 406,220
Claims priority, application Italy, Oct. 16, 1972, 30518/72
Int. Cl. H01h *13/70*
U.S. Cl. 200—5 A **10 Claims**



1. A keyboard switch for the selective closure of a multiplicity of circuits, comprising:

a support;
a printed-circuit board on said support having a face provided with a multiplicity of contact areas respectively included in the circuits to be selectively closed;
a conductive frame on said support;
a multiplicity of pushbuttons on said support spacedly overlying said face with limited mobility perpendicular thereto; and
an array of resilient contact elements on said frame interposed between said board and respective pushbuttons for completing any of said circuits under the control of the associated pushbutton, each of said contact elements being provided with a fixed end and a movable end, said movable end being split into an upbent prong bearing under pressure upon the associated pushbutton and relatively downwardly bent tongue means alongside said prong normally spaced from the corresponding contact area but engageable therewith upon displacement of said prong toward said board by depression of said associated pushbutton.

3,870,841

FLEXIBLE POLYMERIC COMPOSITIONS COMPRISING A NORMALLY PLASTIC POLYMER SULFONATED TO ABOUT 0.2 TO ABOUT 10 MOLE % SULFONATE

Henry S. Makowski; Robert D. Lundberg, and Gopal H. Singhal, all of Westfield, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 2, 1972, Ser. No. 294,489
Int. Cl. C08f *27/06*; **C08d** *11/02, 13/30*
U.S. Cl. 260—23.7 R **47 Claims**

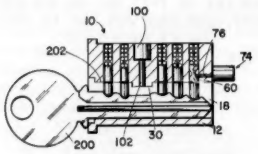
1. A flexible composition comprising:
a normally plastic polymer sulfonated to about 0.2 to about 10 mole percent sulfonate, said plastic polymer being substantially amorphous and having a softening point between about 25°C and 260°C; and
b. about 20 to about 500 parts per hundred by weight based on the sulfonated plastic polymer of a polymer chain plasticizer, said plasticizer being a normally liquid compound having a boiling point of at least 120°C.

3,870,842

LOCKING DEVICE

Robert Paul Bergsman, Philadelphia, Pa., assignor to Leonard Lebowitz, Philadelphia, Pa., a part interest

Filed Nov. 21, 1973, Ser. No. 418,062
Int. Cl. H01h *27/00*
U.S. Cl. 200—44 **13 Claims**



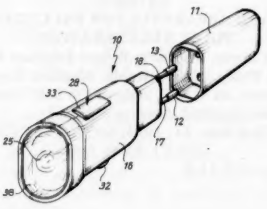
1. A locking device comprising a lock body having a plurality of aligned bores therein; a key barrel having a key passage therein and a plurality of aligned bores formed therein, which are in alignment with respective bores of said lock body, the space between said bores of said barrel and said bores of said lock body comprising a shear line, said barrel being rotatably carried by said lock body and adapted to rotate between at least first and second predetermined positions key operable means comprising a first set of lock pins movably carried in the bores of said barrel; a second set of lock pins movably carried in the bores of said lock body, and disposed substantially in alignment with respective lock pins of said first set; biasing means for normally biasing said lock pins of said second set so that a portion of each of said lock pins extend from the bores of said lock body into the aligned bores of said barrel to prohibit relative movement of said barrel in said lock body; first switch means comprising a first microswitch including a follower pin operatively and selectively linked through said follower pin to at least one lock pin of said second set of lock pins, said one lock pin comprising an hour glass-shaped cam, said first switch means being adapted to be activated upon insertion of a key or like means in said key passage of said barrel, said key or like means causing movement of said hour glass-shaped cam and corresponding movement of said follower pin; and second switch means operatively and selectively linked to said barrel, and adapted to be activated upon rotation of said barrel in said lock body.

3,870,843

ELECTRICAL APPLIANCE WITH HOUSING OF PLASTIC FOAM MATERIAL

Waldemar Witte, Panoramaweg 17, D-7157 Murrhardt, Germany

Filed Dec. 22, 1972, Ser. No. 317,721
Claims priority, application Germany, Feb. 17, 1972, 2207347
Int. Cl. H01h *9/04, 9/06*
U.S. Cl. 200—302 **4 Claims**



1. A small cordless electrical appliance having a main body, comprising in combination,
a plurality of stationary electrical components;
said plurality of stationary electrical components being firmly embedded in solidified plastic foam material;
said solidified plastic foam material forming a passage;
a single slidably movable switching element mounted in said passage;
said plastic foam material forming the final outer surface of said main body.

3,870,844

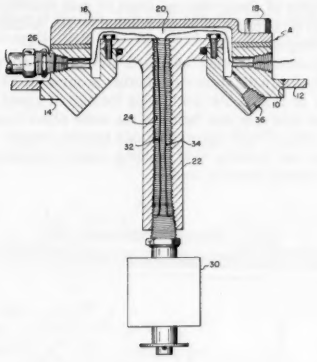
VAPOR PROOF JUNCTION BOX IN COMBINATION WITH ELECTRICAL FLOAT SWITCH ADJUSTABLE FOR HEIGHT

Joseph H. De Frees, 414 Liberty St., Warren, Pa. 16365

Filed Oct. 1, 1973, Ser. No. 401,998
Int. Cl. H01h *35/40*
U.S. Cl. 200—84 R **1 Claim**

1. A float switch for a top opening in a fluid storage tank consisting of a switch body disposed in said opening and extending only slightly above and below the top of the tank; a planar switch cover secured to the top of the body in sealing relation therewith, said cover being of a flat disk type configuration in vertical section of low height so that the body and cover extend only a very slight distance above the top of the tank; said cover forming a shallow chamber between such cover and the body; said body having an elongated downwardly extending stem extending into the tank; said stem having a vertical threaded longitudinal bore in communication with said chamber; at least one electrical junction connection

disposed on the side of the body and in communication with the chamber and below the top of said body; a float switch detachably secured to the bottom of the stem by threads connected in said bore; said switch having wires internally



thereof leading therefrom thence up the bore, thence through the chamber and at least one wire extending out through the junction connection; and said stem being formed of cuttable material so that it may be cut to adjust the height of said float switch in said tank.

3,870,845

VACUUM CIRCUIT INTERRUPTER WITH A PLURALITY OF INTERRUPTING UNITS

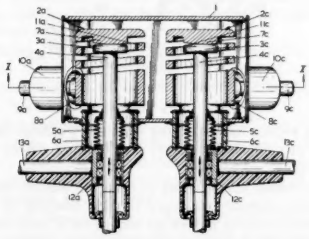
Jan Christiaan Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Oct. 25, 1973, Ser. No. 409,445

Claims priority, application Netherlands, Oct. 27, 1972, 7214615

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **3 Claims**



1. In a vacuum circuit interrupter of the type having two or more identical interrupting units arranged in one evacuated housing, each interrupting unit having a stationary contact and a movable contact, and a plasma screen, which blocks access to the other interrupting units of the plasma generated by the interrupting process of a particular interrupting unit, the improvement comprising: a helicoidal winding of conductive material electrically connected with the electric current circuit of the associated interrupting unit, said helicoidal winding generating a magnetic field for enclosing the plasma of the associated interrupting unit.

3,870,846

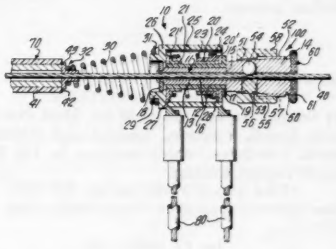
CABLE ACTIVATED SWITCH

Stanislaw F. Filip, Don Mills, Ontario, Calif., assignor to I.C.S. Ignition Control Systems Ltd., Montreal, Quebec, Canada

Filed Sept. 18, 1973, Ser. No. 398,375

Int. Cl. H01h *17/08*

U.S. Cl. 200—161 **15 Claims**



1. A cable activated switch comprising a switch support body having a through bore, a first switch contact member retained on said body, a second switch contact member slidingly retained on said body and insulated therefrom, clamping means for securing a cable extending through said bore, said clamping means having a circular body member with a tapered outer surface portion and a threaded outer portion, said cable extending in a through bore in said body member, at least one transverse bore extending from said tapered outer surface to said through bore, a ball in said transverse bore, said ball being of larger diameter than the depth of said transverse bore, a cylindrical locking sleeve having a tapered inner surface portion and threaded inner portion, said tapered inner surface portion extending substantially parallel to said tapered outer surface so that when said locking sleeve is threaded on said body said tapered inner surface will push said ball into said transverse bore to squeeze said cable on the through bore wall and rigidly retain said cable in said through bore, first resilient means for biasing said contact members, said first and second contact members being displaced relative to each other by predetermined axial movement of said cable.

3,870,847

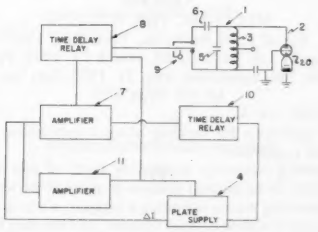
RADIO FREQUENCY HEATER AND CONTROL THEREFOR

John P. Shields, Cleveland, Ohio, assignor to Allegheny Plastics, Inc., Corapolis, Pa.

Filed May 29, 1973, Ser. No. 365,038

Int. Cl. H05b *5/06*

U.S. Cl. 219—10.77 **9 Claims**



7. In an RF heater including an oscillator having a tank circuit and a heating coil, a control circuit for the heater comprising:

A. a power source;

B. at least two capacitors engagable in the tank circuit;
C. means for sensing a change in operating current in the circuit;
D. means responsive to said sensing means for de-energizing the power source and for selecting the capacitors to achieve a high L-C ratio thus increasing the circulating current in the tank circuit; and
E. means for energizing said power source after the capacitors are selected.

3,870,848

MAKING OF CONNECTIONS IN ELECTRICAL POWER DISTRIBUTION SYSTEMS

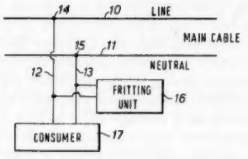
Robert Douglas Naybour, Mynydd Isa, Mold, North Wales; Trevor Farrell, Tarporley, England, and William Elwyn Roberts, Llandudno, Wales, assignors to The Electricity Council, London, England

Filed Aug. 4, 1972, Ser. No. 277,951

Claims priority, application Great Britain, Aug. 5, 1971, 36910/71

Int. Cl. H05b *1/00*

U.S. Cl. 219—50 **12 Claims**



1. Apparatus for fritting a joint in an alternating current power distribution system comprising a fritting unit having two terminals for connection to two conductors of the distribution system on the side of the joint remote from the power supply source, and including a triggerable discharge device connected across said terminals, a manually operable switch, pulse shaping means connected to said terminals for producing pulses synchronised with cycles of the alternating supply fed to said terminals from said conductors, and circuit means connected between the pulse shaping means and the triggerable discharge device and including said switch, which circuit means are operable on closure of said switch to apply to said discharge device one trigger pulse of predetermined duration derived from one of the pulses from the pulse shaping means to make the discharge device conductive for a short time period, said circuit means further including resettable inhibit means preventing application to said triggerable discharge device of further trigger pulses after said one trigger pulse.

3,870,849

MULTI-ARC PIPE WELDING

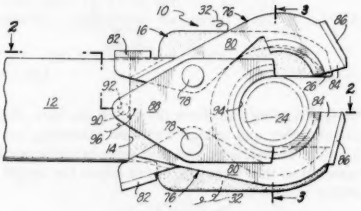
Henry V. Rygiol, 3146 Purer Rd., Escondido, Calif. 92025

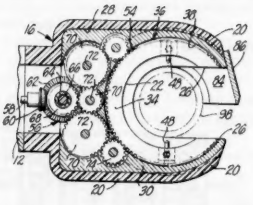
Division of Ser. No. 235,705, March 17, 1972, Pat. No. 3,780,254. This application Aug. 21, 1973, Ser. No. 390,221

Int. Cl. B23k *9/02*

U.S. Cl. 219—60 A **2 Claims**

1. An apparatus for welding along a continuous ring-like line which comprises:
a mounting means for supporting parts of said apparatus adapted to be located relative to parts to be welded,
said mounting means including a support, a non-conductive housing mounted on said support, said housing having an internal cavity located therein, an opening extending therethrough and a notch extending into said cavity from the exterior thereof of said opening, said notch and said opening being of such dimension that parts to be welded are capable of being inserted into said opening through said notch,
a holding means comprising an electrode assembly rotatably mounted within said housing, said assembly having a centrally located opening therein in alignment with said opening in said housing and a notch leading from its exterior to said opening, said notch and said opening being capable of fitting around parts to be welded located so as to extend into said opening,
a plurality of electrodes mounted on said holding means so as to be capable of being rotated by the rotation of said holding means,
said electrodes being insulated from one another, being spaced equally from one another around the axis of rotation of said holder and being located at equal distances from said axis, and being in the same plane transverse to the axis of said opening in said holding means,
means for rotating said holding means relative to said mounting member, and





slip ring means for supplying separate welding currents to each of said electrodes as said holding means and said electrodes are rotated,
retainer means for securing parts to be welded within said housing rotatably mounted on said housing so as to be capable of being moved to secure such parts relative to said housing so that such parts are positioned within said openings,
said slip ring means for supplying separate welding currents includes electrically conductive plates mounted within said housing,
said electrode assembly includes electrode holders in engagement with said plates and rotatably mounted on said plates so that current can pass through said plates to said electrode holders and said electrodes,
terminal plates for use in grounding said parts to be welded within said apparatus attached to said housing so as to extend therefrom in engagement with such parts held in said housing and extending into said openings.

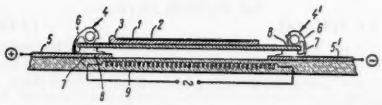
3,870,850
METHOD OF CONNECTING ELECTRICALLY CONDUCTING BODIES

Igor Naumovich Larionov, Kalanchevskaya ulitsa 11, kv. 65, Moscow, and Tom Pavlovich Chernetsky, ulitsa Kommunisticheskaya, 7, kv. 191, Ramoskoe, Moskovskoi oblasti, both of U.S.S.R.

Continuation of Ser. No. 228,652, Feb. 23, 1972, abandoned. This application Apr. 27, 1973, Ser. No. 355,293

Int. Cl. B23k *1/04*

U.S. Cl. 219—85 **3 Claims**



1. A method of connecting electrically conducting bodies using a low-melting material which is introduced into a gap between the bodies being joined and removed from said gap by means of a direct current, comprising:

bringing the bodies to be joined into contact;

bringing a portion of the low-melting material into contact with the end gap between said bodies to be connected;

bringing at least one of said bodies to be connected into contact with external electrodes so that the direction of the electric current passing through the body be parallel to the surface to be connected and be such as to cause movement of said low-melting material in its molten state from the end edges of said bodies into the gap between them;

placing the whole composition comprising the two bodies to be joined and the low melting material into the zone of action of an external heater;

placing said composition in a protective medium;

melting said low-melting material under the action of said external heater;

introducing the melt into said gap between the bodies by means of a first switching-on of a direct current;

a first switching-off of the direct current after the melt has been introduced into said gap;

increasing the temperature by means of said heater to a magnitude sufficient at least for dissolving a layer of material of at least one of said bodies being connected in a quantity slightly exceeding the thickness of the initial gap between said bodies;

reducing the temperature of the external heater to a magnitude slightly exceeding the melting point of said low-melting material;

a second switching-on of direct current of such intensity that the heat evolved upon passage of the current would not cause melting of said bodies being connected;

maintaining passage of the direct current for a time until said low-melting material will collect at one of the end surfaces of said gap between said bodies near the electrode;

a second switching-off of the direct current;

cooling said composition; and

removing the end portion of said bodies being connected together with said low-melting material protruding from the end gap.

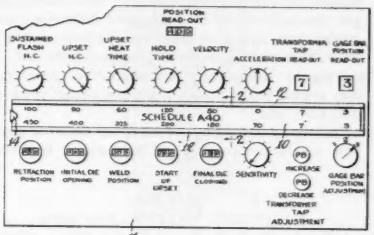
3,870,851
WELDING MACHINES

James F. Deffenbaugh; Arthur L. Williams, Warren, and Robert S. Ellis, Canfield, all of Ohio, assignors to Wean United, Inc., Youngstown, Ohio

Filed Mar. 21, 1973, Ser. No. 343,478

Int. Cl. B23k *11/04*

U.S. Cl. 219—97 **4 Claims**



1. In a welding machine having a program box control panel having a grouped plurality of diverse manually adjustable control devices for welding components wherein each control device is provided with a movable member extending from said panel to effect adjustment thereof to an operational setting required for welding workpieces of differing characteristics with said movable members having a predetermined array on said panel, the improvement comprising:

a plurality of discrete reference members of substantially planar configuration for selective cooperative association with said control panel,

means on the exterior of said panel for removably receiving and supporting a single said reference member on said panel adjacent said array of control device movable members,

each said reference member having indicia thereon specifying the operational setting of each said control device movable member for a desired work to be performed,

said indicia for each said device having a position on said reference member to dispose the same in juxtaposition to its associated said movable member, respectively, when said reference member is received and supported on said panel.

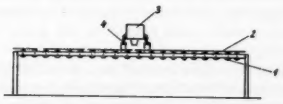
3,870,852
PROCESS AND APPARATUS FOR CUTTING RUBBERISED STRANDED WIRE

Herbert Kogert, Wien, Austria, assignor to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Vienna, Austria

Filed Dec. 1, 1969, Ser. No. 881,235

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 LM **4 Claims**



1. A process for simultaneously cutting two dissimilar materials such as rubberised metal wire for use as reinforcing inserts for the manufacture of tires, comprising the steps of:

placing rubberised wire composed of metallic wire elements enclosed by a rubber coating in a position for performing a cutting operation, the metallic wire elements and the

rubber coating having respectively different melting points;

directing a laser beam along the desired line of cut of the rubberised wire;

enclosing in a nonreactive shielding gas atmosphere said laser beam and said rubberised wire at the point of incidence of said laser beam in order to remove any danger of the rubber igniting;

clamping said rubberised wire with cooled bars, the combination of the steps of enclosing in a non-reactive shielding gas atmosphere and clamping said rubberised wire with cooled bars acting to effectively prevent destruction of the rubber coating in the area adjacent the cut;

removing by suction any decomposition products which may appear at the region of the line of cut of the rubberised wire; and

simultaneously cutting by means of the directed laser beam both the rubber coating and the metallic wire elements.

3,870,853

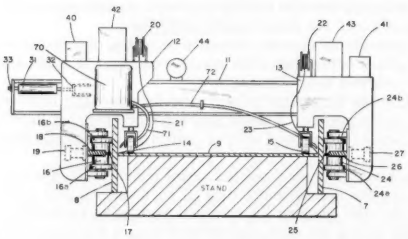
TRAVELING WELDING MACHINE

Paige J. Reinhardt, St. Paul, and Fred A. Olson, Minneapolis, both of Minn., assignors to Paper, Calmenson & Co., St. Paul, Minn.

Filed Aug. 1, 1973, Ser. No. 384,592

Int. Cl. B23k *9/12*

U.S. Cl. 219—125 **1 Claim**



1. A traveling welding machine for simultaneously holding, guiding, welding and propelling the welding machine along components of an unwelded girder having a web and a first flange and a second flange to thereby produce a welded plate girder, said traveling welding machine comprising:

a support member for extending transverse of a girder to be welded, said support member including a first set of rollers for rollably transferring and supporting the traveling welding machine in an upright position, said first set of rollers having axis of rotation located in a first plane, said first set of rollers operable for forming rolling engagement with the web of a girder;

a second set of rollers for guiding said welding machine, said second set of rollers operable for forming rolling engagement with said first and said second flange of said girder, said second set of rollers having axis of rotation substantially perpendicular to said first set of rollers so that said second set of rollers can maintain the orientation of said support member with respect to the girder that is being welded;

a third pair of rollers located in a spaced relationship and having axis of rotation substantially parallel to said second set of rollers, said third set of rollers operable for forming rolling engagement with said first and said second flange of said girder;

a power actuated member attached to said third pair of rollers for simultaneously compressing the components of the girder into a weldable position and for propelling the traveling welding machine along the girder to be welded;

welding means mounted on said welding machine for welding the components of the girder into an integral plate girder member including a pair of welding heads, a pair of flux supply units, a pair of welding rod supply units and a pair of ducts for removing excess flux; whereby said welding means, said guide mechanism and said rollers mounted on said support member coact to simultaneously perform the function of holding, guiding, compressing, welding and propelling the welding machine along an unwelded girder.

3,870,854

ARC WELDING ELECTRODE

Gilbert Vandenbroucke, Zwevegem, Belgium, assignor to N. V. Behaert S.A., Zwevegem, Belgium

Filed Feb. 20, 1974, Ser. No. 444,057

Claims priority, application Germany, Feb. 20, 1973, 2308298

Int. Cl. B23k *35/10*

U.S. Cl. 219—145 **12 Claims**

1. An arc welding electrode object of steel, characterized in that the elongated electrode member having a smooth surface comprises a uniform covering layer, at most 3 mu thick, containing Fe_3O_4.

3,870,855

ELECTRIC HEATING AND BATTERY CHARGING SYSTEM FOR MOTOR VEHICLE

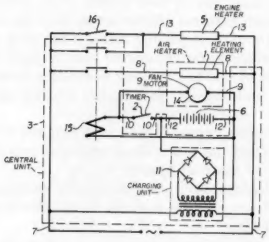
Lars Anders Edlund, Kalmar, and Berth Atle Wikstrom, Ljungbyholm, both of Sweden, assignors to Berth Wikstrom AB, Slojdgatan, Kalmar, Sweden

Filed Jan. 23, 1974, Ser. No. 436,016

Claims priority, application Sweden, Jan. 23, 1973, 7300890

Int. Cl. H05b *1/02*; **F02n** *17/02*

U.S. Cl. 219—202 **3 Claims**



1. A combination battery charger and heater system for a motor vehicle, said system adapted to be energized by a conventional alternating current power source such as 115 volt a. c. or the like, comprising:

a. a warm air heater permanently mounted in the vehicle and including an electric heating element and an electric fan,

b. a central control unit permanently mounted in the vehicle and including:

1. an electric connector adapted to be connected to an outside source of alternating current,

2. a battery charger permanently coupled between the connector and the vehicle battery, and

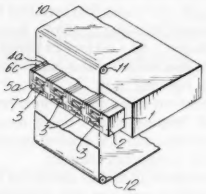
3. a relay coil and associated contacts for coupling the electric heating element to the connector, and

c. a timer permanently mounted in the vehicle and connected in series with the vehicle battery and the electric fan for energizing the fan with low voltage DC power, the timer also being connected in series with the relay coil and the battery simultaneously energizing the relay coil with low voltage DC power.

3,870,856
THERMAL PRINTING HEAD

Hideo Taniguchi, Kyoto, Japan, assignor to Toyo Electronics Industry Corporation, Ukyo-ku, Kyoto, Japan

Filed Feb. 20, 1973, Ser. No. 334,093
Claims priority, application Japan, Feb. 24, 1972, 47-22941
Int. Cl. H05b 1/00
U.S. Cl. 219—216 **14 Claims**



1. A thermal printing head, coupled to a source of electrical energy having first and second terminals, for printing by actuation adjacent thermally sensitive paper, comprising:

a body having a first surface composed primarily of electrically insulating material;

a plurality of heating elements positioned on said first surface of said body two of said heating elements being positioned to define a common junction therebetween and forming a first L-shaped heating element section, two other heating elements being positioned to define a common junction therebetween and forming a second L-shaped heating element section, and three additional heating elements being positioned to define a common junction therebetween and forming a T-shaped heating element section;

first electrically conductive means for connecting in common a first portion of substantially all of said heating elements to the first terminal, wherein said first portion of said two heating elements is adjacent said common junction; and

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3,870,857
CIGAR LIGHTER IGNITING UNIT

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Division, Sun Chemical Corporation, Bridgeport, Conn.

Filed Apr. 4, 1974, Ser. No. 457,963
Int. Cl. F23q 7/22
U.S. Cl. 219—267 **6 Claims**

1. A low cost, automated-production, automatic electric cigar lighter igniting unit subassembly comprising, in combination:

a. a plug body having a metal transverse wall at its inner end,

b. a metal heating element cup aligned with the plug body and having an integral transverse back wall juxtaposed to the transverse wall of said body, said cup being adapted to have secured in it an electric heating element,

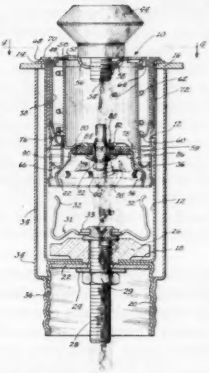
c. a thin smooth-surfaced, deformable insulating wafer disk interposed between said transverse walls,

d. one transverse wall having at least one nib which is offset from its center and projects toward the other wall,

e. said other wall having a plurality of closely spaced recesses facing the said one wall and arranged in a substantially circular configuration about its center, each recess being capable of receiving said nib of the one wall, and

f. rivet means passing through said walls and wafer, for insulatedly securing the same in assembled relation,

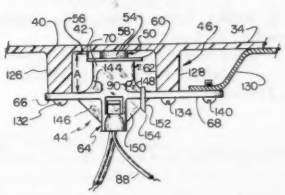
g. said nib being rounded, the spacing of said recesses being sufficiently close and the wafer being readily deformable when compressed between the transverse walls during assembly of the cup to the plug body whereby the nib and recesses are mutually seeking and effect a rotatable orientation of the cup and body so as to lodge the nib securely in one recess.



3,870,858
THERMOSTAT MOUNTING

Thomas O. Schimke, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 9, 1973, Ser. No. 414,382
Int. Cl. F24h 1/00
U.S. Cl. 219—328 **8 Claims**



1. A dishwasher of the type comprising a tub and a door together providing a wash chamber, means for heating the wash chamber, a thermostat for deenergizing the heating means in response to a predetermined temperature in the wash chamber and means mounting the thermostat in heat exchange relation with the wash chamber, the improvement wherein

the tub includes an imperforate wall section having a surface exposed to the wash chamber and an opposite surface;

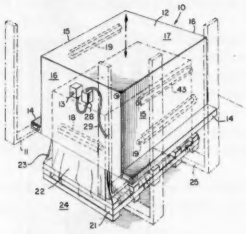
the thermostat includes a body having a flange extending outwardly therefrom past the periphery of the thermostat body and a metallic heat transfer member, including a central projection, between said wall section and said body mating with the opposite surface of the imperforate wall section; and

the mounting means includes means comprising a receptacle having a cavity therein for receiving the thermostat body and an upper edge abutting said flange and means securing said receptacle to said tub thereby binding the heat transfer member against the opposite surface.

3,870,859
CONTROL SYSTEM FOR FRYING APPARATUS

George M. Price, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, Caddo Parish, La.

Filed June 17, 1974, Ser. No. 479,761
Int. Cl. F27d *11/02*
U.S. Cl. 219—437 20 Claims



1. In a system for frying foods, control apparatus for regulating the temperature of heating elements during a cooking phase with the heating elements immersed in cooking fluid in a frypot and during a pyrolytic cleaning phase with the heating elements exposed to the atmosphere, comprising:

first control means for maintaining the temperature of said elements below a first predetermined limit during said cooking phase,

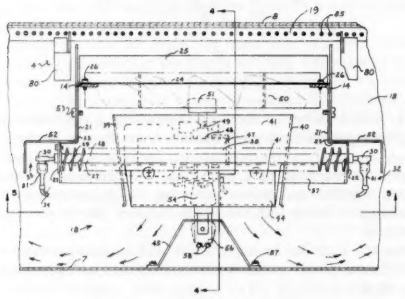
second control means for maintaining the temperatures of said elements below a second predetermined limit during said pyrolytic cleaning phase, and

switch means for connecting said first control means in communication with said heating elements during said cooking phase and for connecting said second control means in communication with said heating elements during said pyrolytic cleaning phase.

3,870,860
FLOOR DROP-IN FORCED CIRCULATION ELECTRIC SPACE HEATER

Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 15, 1973, Ser. No. 341,399
Int. Cl. H05b *1/00*; F24h *3/04*
U.S. Cl. 219—370 16 Claims



1. A heater comprising:

an enclosure defining a chamber including first and second pairs of oppositely opposed side walls, a bottom wall and a top wall, said top wall comprising a grated area having a central portion, a first side portion, and a second side portion, said first and said second side portions being on opposite sides of said central portion, at least one of said oppositely opposed side walls having an opening in it permitting access to said chamber for electrical conducting means;

a member mounted to said enclosure bottom wall and defining a raceway therewith, said opening in said side wall communicating with said raceway, said member forming a protecting shield for said electrical conducting means, said member having at least one opening through it;

a unit removably mounted in said enclosure, said unit including a supporting structure defining a first terminal board area, a second terminal board area spaced from said first terminal board area, a first riser portion extending upwardly from said first terminal board area, a second riser portion extending upwardly from said second terminal board area, and a surface extending from and between said first and said second riser portions, said surface having an opening in it;

heating means attached to said unit and removable therewith, said heating means being mounted from and between said first and said second terminal board areas and electrically connected thereto;

electrical conducting means carried in the raceway defined by said bottom wall and said member;

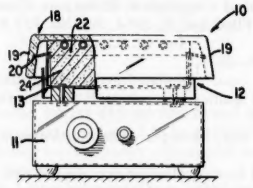
an electrical plug mounted in said enclosure, said plug including a male connecting part and a female connecting part, one of said male and said female connecting parts being mounted in the opening of said member and electrically connected to said electrical conducting means, and the other of said male and said female parts being attached to said unit and electrically connected to said terminal board areas, said male and said female members being aligned for electrical interconnection upon insertion of said unit in said enclosure; and

a fan mounted to said unit and removable therewith, said fan being electrically connected to said terminal board areas, said fan being positioned so as to draw air inwardly through said central portion of said top wall grated area and to direct a volume of air against said bottom wall.

3,870,861
ELECTRIC HOT PLATE HEATING UNIT WITH A CERAMIC COVER

Ewald R. Werych, Elm Grove, Wis., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Mar. 7, 1974, Ser. No. 449,345
Int. Cl. H05b *3/68*
U.S. Cl. 219—459 4 Claims

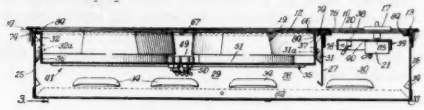


1. In an electric hot plate heating unit, the combination of means defining an enclosure having a bottom and sides, electrical heating and insulating means arranged in said enclosure, latch means at the top edges of said enclosure, a thermally conductive top plate heating surface unit positionable in heat conductive position over said heating and insulating means, said top plate unit having depending flange means thereabout positionable over the top of said enclosure and said heating and insulating means, there being indentations in the inner faces of said flange means to receive said latch means when said top plate is in position on said enclosure and heating and insulating means whereby said top plate is retained thereon.

3,870,862
GLASS-CERAMIC COOKTOP CONSTRUCTION

John T. Doner, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 412,328, Nov. 2, 1973, Pat. No. 3,838,505.
This application June 21, 1974, Ser. No. 482,469
Int. Cl. H05b *3/68*
U.S. Cl. 219—464 **8 Claims**

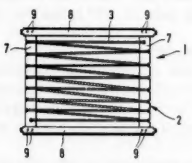


1. A glass-ceramic cooktop comprising:
a glass-ceramic panel;
a frame member;
gasket means around the periphery of the glass-ceramic panel;
burner box side means mounted to said frame and securing the glass-ceramic panel and gasket means to said frame member;
a tray having a sidewall spaced below said panel within the burner box side means;
an insulator in said tray having an upper surface, said insulator having sidewall means projecting above the sidewall of the tray;
an electric heating element disposed on said upper surface of the insulator;
means adjustably securing the tray to the burner box side means for providing abutting relationship between the upper end of the insulator sidewall means and the glass-ceramic surface; and
a burner box bottom member cover attached to said burner box side means enclosing the tray.

3,870,863
ELECTRICAL HEATING ELEMENT FOR BREAD TOASTER OR THE LIKE

Helmut Ohnmacht, D-6744, Germany, assignor to Fritz Eichenauer, Kandel, Germany

Filed Mar. 9, 1973, Ser. No. 339,915
Claims priority, application Germany, Mar. 11, 1972, 2211911
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **8 Claims**

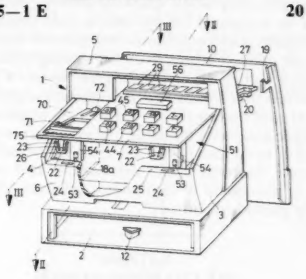


1. A heating element for a bread toaster comprising
an electric heating conductor including a core of a low coefficient of thermal expansion material, said core consisting of threads of mineral fiber material twisted together, electric conducting heating wire helically wound about said core, and means for providing electrical connection of said electric heating conductor, said electric heating conductor being sufficiently rigid to maintain its shape during heating, and
an open framework means for supporting a plurality of loops of said electric heating conductor, said framework means consisting of two spaced insulating support means for supporting said plurality of loops, each of said two insulating support means having a first longitudinal dimension much greater than the width, and two spaced rigid connecting means for holding said two insulating support means in stationary spaced relationship, said two connecting means each having a second longitudinal dimension much greater than the width thereof, and each of said two insulating support means being fixed at respective opposite ends of each of said two spaced connecting means such that said two insulating support means are fixed apart from one another by a distance equal to said second longitudinal dimension of said two connecting means to form an open rectangular area without any structure therebetween, said electric heating conductor being only in contact with said two spaced insulating means of said open framework means and extending across said open framework means between said two spaced insulating means to radiate heat in both directions outwardly from the plane of the open area of said open framework means,
wherein said two spaced connecting means include means for securing the heating element to a housing of a toaster.

3,870,864
TOY CASH REGISTER

Horst Brandstatter, Zirndorf, Germany, assignor to geobra Brandstatter GmbH & Co. KG, Zirndorf, Germany

Filed Jan. 30, 1974, Ser. No. 437,866
Claims priority, application Germany, Feb. 1, 1973, 7303849
Int. Cl. G06c *27/00*
U.S. Cl. 235—1 E **20 Claims**

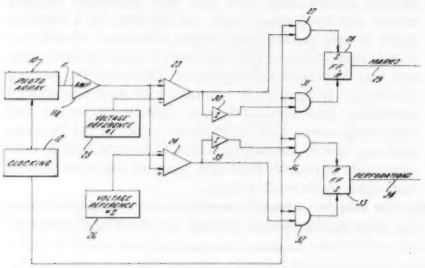


1. A toy cash register comprising
a molded plastic frame having a base, two side walls, a head plate extending between upper portions of said two side walls, a front wall and means defining a frame opening above said front wall;
a face plate mounted in said frame opening;
a rear wall member mounted on said frame and closing the latter from the rear;
a plurality of depressable keys slidably mounted on said face plate;
a plurality of numeral slider means mounted on said face plate and movable into register positions to indicate the register amounts;
lever means operatively connecting associated slider means and keys to effect movement of said slider means to said register positions upon depression of said keys;
pivotal means pivotally mounting said levers on said face plate; and
clearance frame means tiltably mounted on said face plate and operable to engage said levers to temporarily retain the latter and their associated numeral slider means in said register position and to effect release of said levers; said molded plastic frame and face plate being constructed and arranged such that the face plate with said keys, lever means, and clearance frame means mounted thereon is insertable as an assembled unit into said molded plastic frame.

3,870,865
METHOD AND APPARATUS FOR OPTICAL READING OF RECORDED DATA

Edward M. Schneiderhan, Buffalo Grove; John E. Jones, Winnetka, and Henry P. Briggs, Northbrook, all of Ill., assignors to Cummins-Allison Corp., Glenview, Ill.

Filed July 5, 1973, Ser. No. 376,361
Int. Cl. G06k *7/10;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **5 Claims**

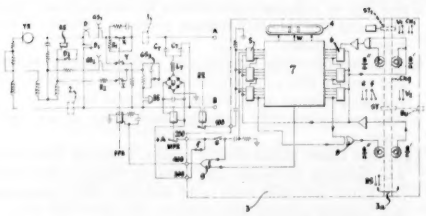


1. A data processing method comprising the steps of recording data on a record medium with the data being represented by a plurality of lines of indicia of different types and having a plurality of different center-to-center spacings, said indicia being selected from the group consisting of reflective optical marks on the record medium and perforations in the record medium, providing a self scanning photodiode array in the form of an integrated circuit with at least two photodiodes located within each center-to-center space of adjacent indicia having the smallest center-to-center spacing of all the indicia to be read so that all of the different types of indicia with different spacings are read by the single self scanning photodiode array, and moving the record medium relatively past said photodiode array with the array extending transversely across the lines of said indicia while directing light onto said indicia to generate electrical signals representing said indicia in response to movement of said indicia relatively past said self scanning photodiode array.

3,870,866
FEE CHARGING SYSTEM

John W. Halpern, 2490 Channing Way, Room 518, Berkeley, Calif. 94704

Continuation-in-part of Ser. No. 197,702, Nov. 11, 1971, abandoned, and a continuation-in-part of Ser. No. 502,652, Oct. 22, 1965, abandoned, which is a continuation-in-part of Ser. No. 261,529, March 12, 1963, abandoned, which is a continuation-in-part of Ser. No. 659,196, April 16, 1957, abandoned. This application Aug. 9, 1972, Ser. No. 279,148
Int. Cl. G06k *5/00, 15/18;* **H04m** *17/02*
U.S. Cl. 235—61.7 R **20 Claims**



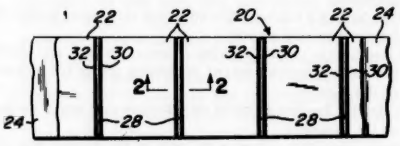
1. An apparatus for the automatic changing of service fees in pay token operated stations, with the pay token having a recorded value, wherein a service charge is determined as a function of units expended including:

a. means for translating numbers of units expended into numbers of service charge units;
b. means for storing said service charge units in a first memory circuit;
c. means for reading and storing the recorded value of a pay token in a second memory circuit;
d. means for relating the contents of said first memory circuit and said second memory circuit, so as to derive a residual value as a difference signal representing the recorded value of the pay token minus the service charge; and
e. means for replacing said value of the pay token by said residual value.

3,870,867
WEB OF RECORD MEMBERS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 92,468, Nov. 24, 1970, Pat. No. 3,783,783. This application Apr. 9, 1973, Ser. No. 349,131
Int. Cl. G09f *3/14;* **G06k** *19/02;* **B44b** *5/00*
U.S. Cl. 235—61.12 R **1 Claim**



1. A web of record members, comprising: a web of supporting material, label material, pressure-sensitive adhesive releasably adhering the label material to the supporting material web, transverse butt cuts through the label material across the entire width of the label material to separate the web into a plurality of labels, and a printed mark extending along the entire length of at least one edge of each label at the butt cut, the mark being formed by invisible ink which is capable of being sensed by reading apparatus.

3,870,868
CONTROL MECHANISMS FOR DOCUMENT-HANDLING APPARATUS

Alan P. Jones, Levittown, Pa., assignor to Pennsylvania Research Associates Inc., Cornwells Heights, Pa.

Filed July 21, 1972, Ser. No. 273,999
Int. Cl. G06m *9/00*
U.S. Cl. 235—92 SB **15 Claims**

1. A sensor for detecting the presence of gaps between documents fed in a first direction at spaced intervals with said gaps occurring between the trailing edge of a document and the leading edge of the next document, said sensor comprising:

a light source positioned to one side of the path of movement of the documents;

light sensitive means positioned to receive light of maximum intensity from said light source when the trailing edge of each document passes said light sensitive means to activate said light sensitive means and to receive light of a minimum intensity when a document is positioned between said light sensitive means and said source, said light sensitive means developing a signal at its output which varies with the intensity of light;

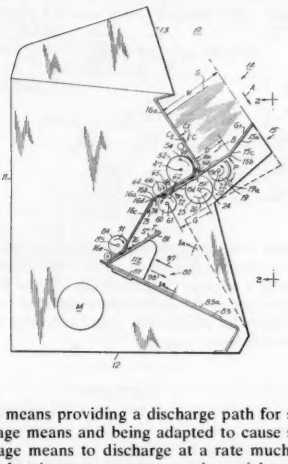
energy storage means;

first means coupled to said light sensitive means output for rapidly charging said energy storage means when said light sensitive means is activated by light of maximum intensity;

comparator means having first and second inputs for generating an output signal when the signal level at its first input exceeds the signal level at its second input;

said first input being coupled to the output of said light sensitive means;

second means coupled between said first means and said comparator means second input for coupling a portion of the signal level developed by said storage means to said second input;



said second means providing a discharge path for said energy storage means and being adapted to cause said energy storage means to discharge at a rate much slower than the charging rate to cause a substantial portion of the signal level developed by said storage means to be retained when said light sensitive means is deactivated due to the movement of the document past said light source.

3,870,869

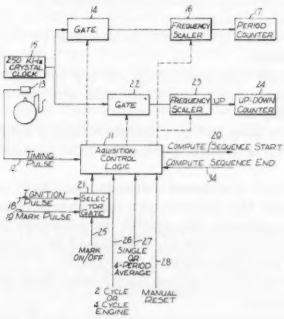
DIGITAL APPARATUS FOR THE TIMING AND ANALYSIS OF INTERNAL COMBUSTION ENGINES

Arthur Eberle, Upper Arlington, and Nicholas A. Spitzer, Columbus, both of Ohio, assignors to Columbia Gas System Service Corporation, Columbus, Ohio

Filed Apr. 26, 1973, Ser. No. 354,849

Int. Cl. H03k *21/34*

U.S. Cl. 235—92 FQ **20 Claims**



1. Digital analyzing means for a rotating body, said means comprising:

A. clock signal source means to produce fixed repetition rate clock signals;

B. a first counter;

C. first connecting means to connect said first counter to said source means to count a first number n_1 of said clock signals at a repetition rate of f_c while said body rotates through a first angle;

D. a second counter;

E. second connecting means to connect said second counter to said source means to count a second number n_2 of said clock signals at a rate of kf_c proportional to the repetition rate f_c while said body rotates through a second angle;

F. first signal generating means connected to said clock signal source means to generate a first signal having a repetition rate f_1 proportional to the repetition rate f_c and to said number n_1 and inversely proportional to a maximum count n_m;

G. means connected to said first signal-generating means to count a selected number n_3 at said repetition rate f_1 to establish a first time interval $t_1 = n_3/f_1$;

H. second signal-generating means connected to said clock signal source means to generate a second signal having a repetition rate f_2; and

I. means connected to said second signal-generating means to count from zero to a number n_4 at a rate f_2 for said time t_1 such that $n_4 = t_1 f_2$ is a measure of angular rotation of said rotating body.

3,870,870

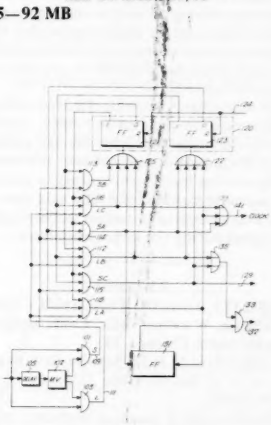
DECODER FOR HIGH DENSITY DECODING SYSTEM

Andrew Gabor, Huntington, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Continuation of Ser. No. 167,437, July 29, 1971, abandoned, which is a continuation of Ser. No. 735,931, Feb. 26, 1968, abandoned, which is a division of Ser. No. 458,110, May 24, 1965, Pat. No. 3,374,475. This application July 25, 1973, Ser. No. 382,550

Int. Cl. H03k *21/10*

U.S. Cl. 235—92 MB **6 Claims**



1. A decoding means for representing clock and information pulses from a train of pulses which are separated by first and second intervals of different lengths, comprising:

means to separate said pulses into a first group which are preceded by said first interval and a second group which are preceded by said second interval,

a counter,

a first plurality of gates connected to receive said pulses of said first group,

a second plurality of gates connected to receive said pulses of said second group,

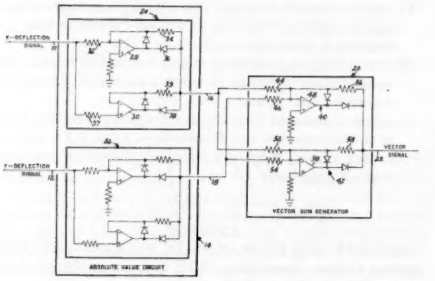
means to enable a different one of the gates in each of said first and second pluralities in response to each different condition of said counter, and

means to switch said counter between its conditions in a first manner in response to pulses of said first group and to shift said counter between its conditions in a second manner in response to pulses of said second group.

3,870,871
VECTOR MAGNITUDE SUMMING CIRCUIT

Thomas Edward Nead, 11645 Thistlehill Dr., Loveland, Ohio 45140

Filed Nov. 29, 1973, Ser. No. 420,066
Int. Cl. G06g *7/22*
U.S. Cl. 235—197 **10 Claims**



1. An apparatus for producing a vector signal representing approximately the vector magnitude of first and second input signals representing quantitative magnitudes occurring in perpendicular directions, the apparatus comprising:

a. means responsive to the first and second input signals for producing first and second control signals respectively;

b. a first means having an output and inputs connected to the producing means for modifying the first control signal by a first fractional constant and the second control signal by a second fractional constant to provide a first output signal therefrom; and

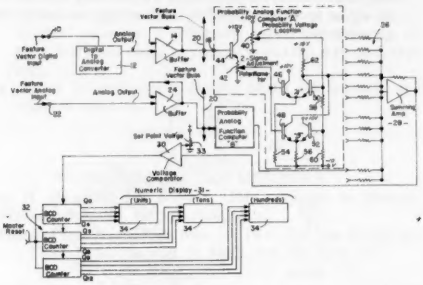
c. a second means having an output connected to the output of the first modifying means and inputs connected to the producing means for modifying the first control signal by the second fractional constant and the second control signal by the first fractional constant to provide a second output signal therefrom, whereby said first and second means being operative to sustain as the vector signal the output signal having the larger magnitude.

3,870,872
PROBABILITY ANALOG FUNCTION COMPUTER

Wayne R. Johnson, Woodland Hills, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 1, 1974, Ser. No. 438,844
Int. Cl. G06g *7/26*
U.S. Cl. 235—197 **6 Claims**

1. A probability analog function computer comprising: an input circuit for receiving input analog voltages; a first differential amplifier circuit connected to said input circuit for producing in accordance with a first transfer function curve a negative-going output signal in response to analog input voltages below a predetermined reference voltage and a positive-going output signal in response to analog input voltages above said predetermined reference voltage; a second differential amplifier circuit connected to said input circuit for producing in accordance with a second transfer function curve a positive-going output signal in response to analog input voltages below said predetermined reference voltage and a negative-going output signal in response to analog input voltages below said predetermined reference voltage; a common output circuit connected to said differential amplifiers; an unbalancing impedance means interconnecting said differential amplifiers for displacing the cross-over point of said first and second transfer function curves to enable said output circuit to produce output signals in the vicinity of said cross-over point in

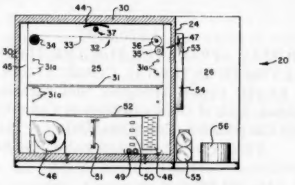


accordance with an approximate Gaussian distribution function curve; means connected to said differential amplifiers for establishing a selected 2-sigma width for said Gaussian distribution function curve; and means connected to said differential amplifiers for establishing a selected value for said predetermined reference voltage.

3,870,873
ENVIRONMENTAL CHAMBER

Roy E. Mallory, Salt Lake City, Utah, assignor to MBR Corporation, Salt Lake City, Utah

Division of Ser. No. 131,879, April 7, 1971, Pat. No. 3,746,080. This application June 29, 1973, Ser. No. 376,400
Int. Cl. F21v *9/02*
U.S. Cl. 240—1.1 **2 Claims**



1. An environmental chamber comprising

an enclosure having

a top having a reflective inner surface;

a bottom;

end walls interconnecting said top and said bottom;

side walls interconnecting said top, bottom, and end walls;

an Xenon lamp having a spectrum closely approaching that of natural daylight positioned close to and beneath the top;

a reflector positioned between the lamp and the top whereby the reflector and the top reflect light from the lamp uniformly throughout the enclosure such that uniform energy levels are maintained at constant distances from the lamp within the enclosure;

circuit means connecting said Xenon lamp to a source of electricity;

means for continuously circulating a liquid coolant around the Xenon lamp;

filter means comprising a plurality of filters of different degrees opaqueness positioned below the Xenon lamp and above the bottom; and

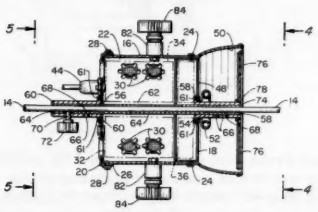
means for positioning said filter means to stretch substantially between the end and side walls, said means comprising programming means to selectively position the filters whereby the light spectrum at the side of the filters opposite the Xenon lamp can be varied as necessary to correspond to changing natural daylight spectrum.

3,870,874

SELF-CONTAINED LIGHT SOURCE DEVICE FOR CENTER MOUNTING OF PHOTOGRAPHIC REFLECTOR

Raymond George Larson, 9731 Rainier Cir., Huntington Beach, Calif. 92646

Filed July 23, 1973, Ser. No. 381,926
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **3 Claims**



1. A photography light source device for cooperative center mounting of a reflector comprising the combination of: an outer housing forming an interior chamber and having a flared end which is of larger diameter than the remainder of said housing; a rear wall member secured to said housing opposite said flared end; a front wall member inwardly positioned with respect to said flared end and secured to said housing adjacent said flared end; said front wall and the interior surface of said flared end having light reflective surfaces; each of said front and rear wall members having aligned outwardly extending boss-like members having a bore therethrough an elongate sleeve member disposed within the bore of said boss-like members and extending through said interior chamber; means for securing said sleeve member to said boss-like members; an elongate rod shiftably disposed in said sleeve member for mounting a light reflector; said boss-like members extending a sufficient distance exteriorly of said front and rear walls to provide a support for said elongate sleeve member and said elongated rod when the latter is positioned within said sleeve member; a light source mounted within said flared end of said outer housing; a light-protective screen or grid member secured to the front wall boss-like member in front of said light source; means secured to the side of the outer housing for mounting said housing or a tripod support member; said sleeve member and said rear boss-like member having aligned threaded openings when secured together adapted to receive a thumbscrew for locking said elongate rod in selected positions; and electrical means mounted within said chamber in electrical conductive relationship with said light source and adapted to be connected to an energy source to energize said light source.

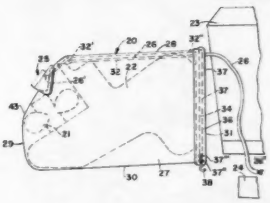
3,870,875

INBOARD OUTBOARD MOTOR COVER

William B. Altimus, Box 968, Livingston, Mont. 59047

Filed Apr. 2, 1973, Ser. No. 347,047
Int. Cl. F21v *33/00*; **B65b** *11/54*
U.S. Cl. 240—2 R **1 Claim**

1. A cover in combination with a propellor and adjacent rear drive assembly for an outboard motor boat wherein said propellor and rear drive assembly project from the rear of the boat, said cover comprising an elongated sleeve-like flexible waterproof sheet member permanently closed at one end and open at the other end and adapted to be slipped over said propellor and drive assembly through the open end with the open end being of a diameter so as to fully enclose about the drive assembly, said cover being only of a length to cover and surround the rear drive assembly and the propellor, with the closed end covering and surrounding the propellor, draw string tightening means mounted around the open end of the cover to draw the open end of the cover snuggly about the rear drive assembly as to embrace the assembly in substantially watertight relation, the cover having an opening in said rearward closed end for air to ventilate out of the interior of the cover, a folded panel member permanently attached to the



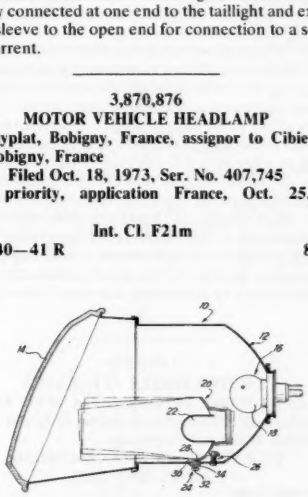
exterior of said cover with its top and side edges secured to the top and side edges of the opening and draping downward therefrom to form a weather shield over said side edges and top edges of said opening to shield the opening and with the bottom edge of the shield permanently bowed out, so that air may pass freely through the opening and from the interior to the exterior of the cover via the bottom edge of the shield, an electric light mounted to the exterior surface of the shield to direct light rearward to serve as a taillight, electric cord means electrically connected at one end to the taillight and extending along the sleeve to the open end for connection to a source of electric current.

3,870,876

MOTOR VEHICLE HEADLAMP

Olivier Puyplat, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Oct. 18, 1973, Ser. No. 407,745
Claims priority, application France, Oct. 25, 1972, 72.37832
Int. Cl. F21m
U.S. Cl. 240—41 R **8 Claims**



1. A motor vehicle headlamp comprising:
a first light source disposed within a main parabolic reflector,
a secondary parabolic reflector, together with a second light source disposed therewithin, positioned within the main reflector,
a pivotal connection provided between the secondary and main reflectors for allowing relative angular displacement therebetween, said pivotal connection comprising coop-

erating arcuate abutment surfaces, at least one of which is disposed on each reflector,

readily releasable means for maintaining said cooperating abutment surfaces in contact, and

an adjustment device for controlling the relative angular displacement of the secondary reflector with respect to the main reflector.

3,870,877

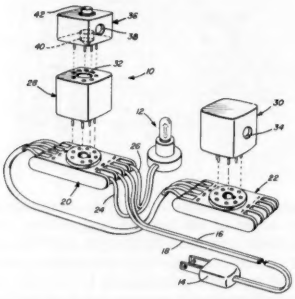
STATIC SWITCHING CONTROL

Paul D. Tolbird, P.O. Box 7103, Monroe, La. 71201

Filed Oct. 2, 1973, Ser. No. 404,813

Int. Cl. H05b *37/02;* **H01h** *47/24;* **H01j** *39/12*

U.S. Cl. 250—209 **14 Claims**



1. A light responsive control system comprising a source of electrical energy, an electrically controlled device, terminal connecting means interconnecting the source and the device for supply of energizing current to the device, a pair of light actuated switch modules for respectively closing and opening an energizing circuit through said device, and circuit holding means for maintaining said energizing circuit closed upon actuation of one of the switch modules until reset by actuation of the other of the switch modules, said circuit holding means including rectifier means connected to said source for establishing a dc power supply, illumination generating means connected to said power supply for actuating one of the switch modules when energized, light activated, latching switch means connected to the illumination generating means for energizing the same and reset means connecting the latching switch means to the other of the switch modules for unlatching the switch means to deenergize the illumination generating means.

3,870,878

LIGHT BARRIER APPARATUS

Arthur A. W. Walter, Denzlingen, and Erwin Langenbach, Buchholz, both of Germany, assignors to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed May 16, 1973, Ser. No. 360,966

Int. Cl. H01j *5/02*

U.S. Cl. 250—239 **16 Claims**

1. An enclosure for defining a chamber optically communicating with an environment external to said chamber, for housing an active optical element, said enclosure comprising:

a. a housing having an elongated bore extending therethrough, said bore having first and second ends communicating to the exterior of said housing and a first step peripheral to said first end of said bore;

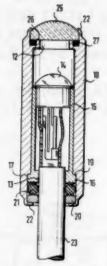
b. a lens sealed over said second housing end; and

c. an integral optical element-bearing assembly comprising:

i. a sleeve slidable into said bore, and having first and second ends;

ii. an active optical element comprising one of a lamp and a photocell mounted proximate said second end of said sleeve;

iii. an electrical connector for connecting said active optical element to an electrical circuit for enabling operation of said active optical element; and



iv. said sleeve having a flange around the periphery of a first end thereof, said flange being engageable with said first step for establishing a press fit relation of said sleeve in said bore defining the maximum extension of said sleeve into said bore at which maximum extension said active optical element is located substantially at the focal point of said lens.

3,870,879

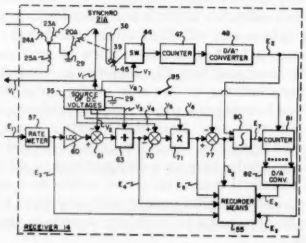
MEANS AND METHOD FOR PROVIDING AN OUTPUT CORRESPONDING TO THE EXPECTED SUBSIDENCE OF A FROZEN EARTH FORMATION

Alexander S. McKay, Calgary, Alberta, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Alberta, Canada

Division of Ser. No. 296,422, Oct. 10, 1972,. This application July 5, 1973, Ser. No. 376,768

Int. Cl. G01t *1/16*

U.S. Cl. 250—269 **8 Claims**



1. A method for providing an output corresponding to the expected subsidence of a frozen earth formation, having a borehole, upon thawing, which comprises the following steps of inserting a sensor in the borehole, sensing a characteristic of the frozen earth formation with the sensor, providing a signal corresponding to the sensed characteristic, providing a signal corresponding to the density of the frozen earth formation in accordance with the sensed characteristic signal, and providing the output corresponding to the thaw subsidence in accordance with the density signal.

3,870,880
PROCESS AND DEVICE FOR STUDYING THE STRUCTURE OF SINGLE CRYSTALS

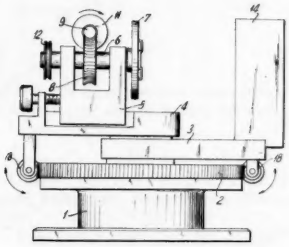
Henri Merigoux; Jean-Francois Darces, both of Besancon, and Jean-Yves Exertier, Valence, all of France, assignors to Henri Merigoux, Besangon, France

Filed Oct. 9, 1973, Ser. No. 404,247

Claims priority, application Switzerland, Oct. 11, 1972, 14809/72

Int. Cl. G01t *23/20*

U.S. Cl. 250—273 **11 Claims**



1. A method for the control of single crystals by the detection of the reflections of X-rays irradiating said single crystals, comprising the steps of:

a. positioning a specimen crystal on a rotatable support;

b. rotating said support about its own axis at a fast speed of rotation and simultaneously sweeping with said rotatable support at least a part of the angular field of irradiation of the X-rays to obtain reflections;

c. determining the orientation of a direction of the specimen from the angles of said reflections;

d. replacing said rotatable support at one of the positions of reflection derived from said fast rotation of the rotatable support;

e. rotating said rotatable support about its own axis at a low speed of rotation until the said reflection occurs again;

f. reading the angular position of said rotatable support; and

g determining therefrom the orientation of another direction of the specimen.

3,870,881
METHOD OF ANALYZING OUTPUT SIGNALS REPRESENTING THE MASS SPECTRUM FROM A SCANNING MASS SPECTROMETER

John Stephen Halliday, Sale, and Brian Noel Green, Manchester, both of England, assignors to Associated Electric Industries, London, England

Continuation of Ser. No. 82,479, Oct. 20, 1970, abandoned, which is a continuation of Ser. No. 538,876, Jan. 6, 1966, abandoned. This application June 6, 1972, Ser. No. 260,315

Claims priority, application Great Britain, Jan. 7, 1965, 755/65

Int. Cl. H01j *39/34*

U.S. Cl. 250—283 **24 Claims**

1. The method of mass measuring a sample with a mass spectrometer including means to ionize substances, an analyzer, and collector means comprising:

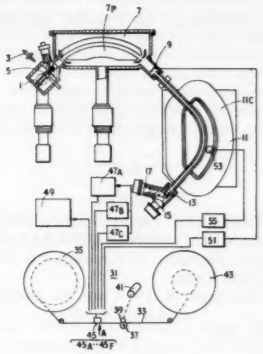
a. simultaneously ionizing the sample and a reference compound;

b. concurrently passing ions from both the sample and the reference compound through the analyzer to the collector means while scanning the mass spectrum to collect data as to the mass spectrum of the sample and the reference compound with the collector means;

c. producing electrical outputs with said collector means representative of the data collected;

d. digitizing signals derived from said collection means outputs;

e. evaluating the digitized signals with a computer and in so doing evaluating a first peak of the sample with respect to a pair of reference compound peaks of different positions on the mass spectrum to locate the position of the first sample peak with respect to a segment of the spectrum established by said reference peaks and with respect to one of the reference peaks whereby to identify said first sample peak with respect to its position relative to said



one peak, said segment thereby minimizing the effects of deviations in the results of the scan producing said first sample peak and said first and second reference peaks from an ideal scan;

f. said evaluation of said first peak of the sample being made according to assumed scan conditions established by said pair of reference compound peaks to compensate for variations from an ideal scan due to hysteresis and the like and whereby to produce a mass analysis of a sample without need for a visible spectrum.

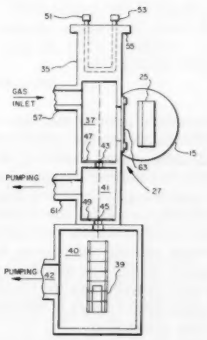
3,870,882
ESCA X-RAY SOURCE

Paul E. Larson, Acton, Mass., assignor to GCA Corporation, Bedford, Mass.

Filed May 23, 1973, Ser. No. 363,141

Int. Cl. H01j *37/00*

U.S. Cl. 250—305 **6 Claims**



1. An electron spectrometer comprising:

means for holding a sample which is to be analyzed;

means for analyzing photoelectrons given off by said sample as a function of their energies thereby to obtain an energy spectrum;

housing means defining an X-ray target chhamber;

means for providing neon gas to said chamber at substantial pressure, said housing means also defining a chamber separate from said target chamber, there being a small aperture between said chambers;

in said separate chamber, an electron gun for directing, through said small aperture a narrow beam of electrons into said target chamber at an energy level above that required to excite the neon Kα emission line;

means for pumping the electron gun chamber to maintain a vacuum in the presence of gas flow through said aperture; and an X-ray window in said target chamber allowing X-rays comprising mainly the Kα neon emission line to essentially directly irradiate said sample without intervening dispersive selection thereby to obtain from said analyzing means a spectrum of improved resolution.

3,870,883

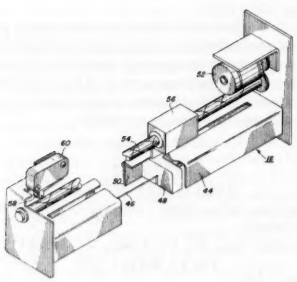
ELECTROSTATIC PRINTING MACHINE WITH SELF-CLEANING CORONAL GENERATING DEVICE

Jack R. Oagley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1973, Ser. No. 400,077

Int. Cl. G03g *15/00*

U.S. Cl. 250—324 **4 Claims**



1. An improved electrostatic printing machine comprising means defining a photoconductive surface which is adapted to move around a closed path, means including at least one corona generating device for making a copy of an original document, the corona generating device being disposed adjacent the photoconductive surface along the closed path, the corona generating device having a corona wire and a generally U-shaped elongated shield around the corona wire, and a cleaning pad contacting the corona wire and the inner surface of the shield such that when moved along the device, the wire and substantially the entire inner surface of the shield will be cleaned, the improvement comprising:

means for automatically moving the cleaning pad along the corona wire and shield to complete a cycle of operation upon receiving an input signal after a predetermined machine event has occurred.

3,870,884

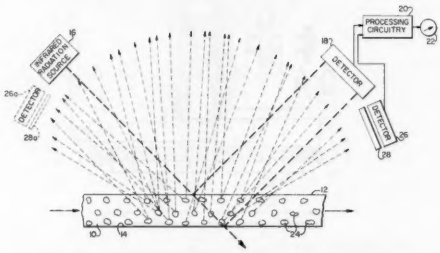
APPARATUS FOR NEGATING EFFECT OF SCATTERED SIGNALS UPON ACCURACY OF DUAL-BEAM INFRARED MEASUREMENTS

Paul Williams, Columbus, Ohio, assignor to Infra Systems, Inc., Columbus, Ohio

Continuation of Ser. No. 391,046, Aug. 24, 1973, abandoned. This application June 26, 1974, Ser. No. 483,085

Int. Cl. G01t *1/16*

U.S. Cl. 250—339 **10 Claims**



10. A dual-beam, reflection-type infrared measuring system for measuring a property of a film by the use of infrared absorption phenomena comprising:

a. an infrared radiation source for generating first and second beams of infrared energy, each of said beams being at different respective wavelengths, one of said beams being the absorption beam which is selected to undergo greater absorption with respect to the film property being measured than the other beam known as the reference beam,

b. first means positioned with respect to said source for detecting energy from said beams specularly reflected from the front and rear surfaces of said film, as well as beam energy scattered from the film,

c. means for processing the detected energy to provide a ratio measurement of the detected signals corresponding to the detected absorption and reference beams,

1. said processing means including second means positioned with respect to said source for detecting energy from said beams scattered from the film but not detecting energy specularly reflected from the film surfaces and responsive to the scattered energy at the wavelength of the reference beam but not at the wavelength of the absorption beam, for substantially negating the effect on said ratio measurement of scattered energy received at said first detecting means.

3,870,885

DEVICE FOR MEASURING ABSORPTION

Ernst Ammann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 23, 1974, Ser. No. 435,825

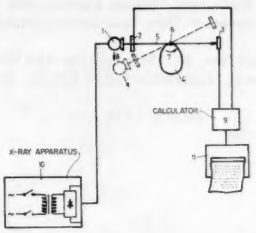
Claims priority, application Germany, Feb. 7, 1973, 2306006

Int. Cl. G01t *1/16*

U.S. Cl. 250—360 **1 Claim**

1. A device for absorption measurements by X-rays, comprising, in combination with a source of X-rays producing a central ray, two measuring devices adapted to be located on opposite sides of the object being measured for measuring ray intensity, said devices being located in the path of said central ray, means connected with said source and said two measuring devices for jointly rotating them about a point located in the path of said central ray and for jointly shifting them in direc-

tions perpendicular to said central ray and to their axis of rotation, and a computer connected with said two measuring



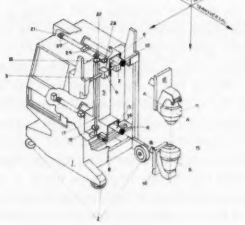
devices for determining absorption values from the ratios of the signals delivered by said measuring devices.

3,870,886

SCANNING DEVICE FOR SCINTIGRAPHY

Renato Casale, Rome, Italy, assignor to Ital Elettronica S.p.A., Rome, Italy

Filed July 5, 1972, Ser. No. 269,009
Claims priority, application Italy, July 28, 1971, 51968/71
Int. Cl. G01t 1/20
U.S. Cl. 250—367 **6 Claims**



1. A device for the scintigraphic scanning according to a horizontal plane, characterized in comprising:

a. A support provided with two linear guides horizontally and longitudinally located, one of which is located in the upper part of the support, while the second is located in the lower part of the support;

b. A carriage, movable with respect to the support along said guides, being provided in its upper part, projecting above the support, with rolling means for supporting and causing to slide along a linear axis thereof a support rod for supporting a supporting a detector, being horizontally and transversely located, said carriage being further provided in its lower part with a recess for receiving rolling means for supporting and causing to slide along an axis thereof a second support rod for a second detector, said second rod being located parallel to the first rod and below it;

c. A pair of support rods for detectors, at least one support rod having thereon a radiation detector, the first of said rods being supported above the support in a sliding way along its axis, by the rolling means located in the upper part of the carriage, and the second rod supported slidingly along its axis by rolling means contained in a recess provided in the lower part of the carriage;

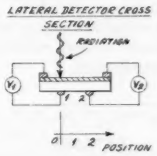
d. A vertical shaft supported by said carriage on which is mounted a toothed wheel for each rod, each toothed wheel engaging a positive drive chain or the like, which is connected to each said rod so that the rotation of the shaft determines the simultaneous displacement of the two rods along their axes; and single motor means for driving both said shaft and carriage during a scanning operation.

3,870,887

OPTICAL IMAGE POSITION INDICATOR MEANS USING TIME AND PHASE DELAY SENSING

James E. Dueker, and Lloyd E. Brunkhorst, both of Florissant, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 10, 1973, Ser. No. 405,022
Int. Cl. G01t 1/16
U.S. Cl. 250—370 **18 Claims**



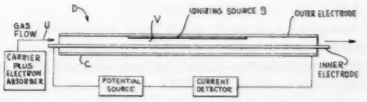
1. A detector device comprising a wafer-like element formed by contiguous layers of p and n type semi-conductor materials arranged and positioned to form a barrier therebetween, means forming a conductor layer on one of said layers on one side of the device, means biasing said conductor layer to a predetermined operating condition, a second electrode attached to the other semi-conductor layer at a location thereon spaced laterally from the conductor layer on the opposite side of the device, voltage sensitive means connected to said second electrode including means responsive to the time of occurrence of voltages produced thereat when radiation energy impinges on the said one semi-conductor layer, the time of occurrence of the voltage produced at said second electrode depending on the distance between where the radiation energy impinges and the said electrode and on the charge carrier mobility characteristic of at least one of the layers of semi-conductor material in a direction substantially parallel to the barrier.

3,870,888

ELECTRON CAPTURE DETECTORS

James Ephraim Lovelock, Bowerchalke, near Salisbury, Wiltshire, England

Filed May 8, 1972, Ser. No. 250,953
Claims priority, application Great Britain, May 8, 1971, 13877/71; July 29, 1971, 35593/71
Int. Cl. G01t 1/16
U.S. Cl. 250—384 **1 Claim**



1. In an electron capture detector of the type having a detector defining an ionization chamber through which a gas sample including an electron absorber is flowable, and comprising an outer electrode, a radiation source at the inner surface of said detector, and an inner electrode mounted within said detector, an improvement particularly for improving performance with relatively weak electron absorbers and comprising:

a radioactive tritium ionizing source distributed lengthwise through the chamber for subjecting all gas therein to radiation;

an ionization chamber length which is at least ten times greater than any lateral dimension of said chamber for causing a gas sample to move along said chamber as a discrete plug, and with a minimum of mixing between adjacent sample portions, in which the chamber length is 15 cm. and the chamber diameter is 5 mm;

means for flowing the gas sample into and along said chamber at a relatively high flow rate in excess of 50 mls/minute to provide a large mass flow of said detectable electron absorber, the reduction in proportion of said electron absorber converted into negative ions occasioned by said high flow rate being substantially compensated by a corresponding large chamber volume, whereby high flow rate and large chamber volume facilitate detecting low concentrations of electron absorbers;

whereby to tend to minimize the time required to remove last detectable traces of even relatively weak electron absorbers from the chamber.

3,870,889

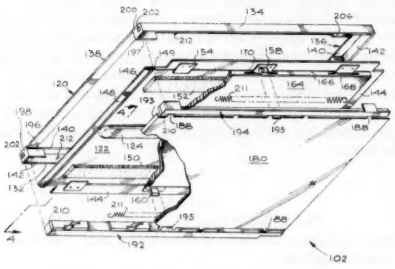
FILM SHEET CASSETTE

Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.

Filed Dec. 26, 1973, Ser. No. 428,618

Int. Cl. G01n *21/34*

U.S. Cl. 250—480 **10 Claims**



1. A film sheet cassette comprising:

a back plate and cover plate fixed in spaced substantially parallel relationship;

raised elongated means disposed on said back plate projecting toward said cover plate;

a resilient back screen plate disposed between said back plate and cover plate;

a resilient pressure screen plate disposed between said back screen plate and cover plate; and

actuatable means supported in said cassette for moving said pressure screen plate between an open first position spaced from said back screen plate and a closed second position engaging said back screen plate and deforming both said back screen plate and said pressure screen plate around said raised means.

3,870,890

METHOD AND APPARATUS FOR MEASURING MUTUALLY PERPENDICULAR DIMENSIONS

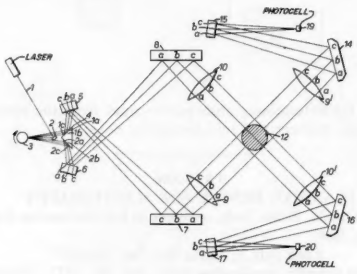
Sidney David Binks, and William Hurton, both of Sheffield, England, assignors to Davy Instruments Limited, Sheffield, England

Filed Nov. 30, 1973, Ser. No. 420,708

Claims priority, application Great Britain, Dec. 1, 1972, 55478/72

Int. Cl. G01b *7/04*

U.S. Cl. 250—560 **15 Claims**



15. Apparatus suitable for determining first and second mutually perpendicular cross sectional dimensions of an elongate workpiece comprising a measuring zone for receiving the workpiece, a laser, a mirror for reflecting a narrow light beam from the laser onto the reflecting surfaces of a rotatable *n* sided polygon, means for rotating said polygon at a known constant speed, a prism arranged to receive the reflected light from the polygon and to reflect the beam in one direction during the first part of the scan and in another direction during the second part of the scan, optical means for directing the beam during the first part of the scan across the measuring zone, optical means for focussing the beam passed across the zone onto a first photo-electric transducer, electronic means associated with the transducer for determining the time during each scan in which the beam impinges upon a workpiece in the zone and electronic means for determining the dimension of the workpiece from a plurality of scans, optical means for directing the beam during the second part of each scan across the measuring zone in a direction at right angles to the beam during the first part of each scan, optical means for focussing the beam passed across the zone during the second part of each scan onto a second photo-electric transducer, electronic means associated with the second transducer for determining the time during each scan in which the beam impinges upon a workpiece in the zone and electronic means for determining the dimension of the workpiece from a plurality of scans.

3,870,891

MAGNETIC LENSES

Thomas Mulvey, Birmingham, England, assignor to The National Research Development Corporation, London, England

Filed Aug. 31, 1973, Ser. No. 393,532

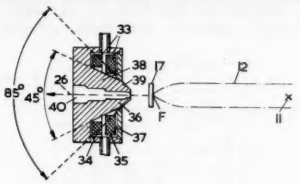
Claims priority, application Great Britain, Sept. 4, 1972, 40888/72

Int. Cl. H01j *37/26*

U.S. Cl. 250—398 **9 Claims**

1. An apparatus which comprises a source operative to produce a beam of charged particles along a given axis, and a magnetic lens which provides substantially the only means for focusing the said beam onto a target position on the axis between the said source and magnetic lens, the said magnetic lens being operative to provide a substantially radial field in the focusing region, said lens being located on the side of said target position opposite to said source and comprising an electrically conducting wire coil having a front face which lies

in a plane perpendicular to the said given axis, the axis of said coil being coaxial with said given axis, said lens further com-



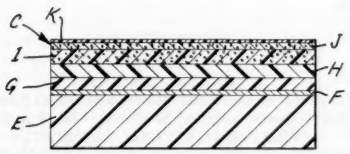
prising a polepiece composed of material of high magnetic permeability which extends along said core axis towards said source at least within the space surrounded by the coil.

3,870,892

SYSTEM FORMED BY THE COMBINATION OF A SOLID - STATE IMAGE INTENSIFIER AND A COMPATIBLE ADAPTED X-RAY FILM

Leonard Fass, Albisola Superiore, and Ennio Fatuzzo, Ferrania, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1973, Ser. No. 326,741
Claims priority, application Italy, Feb. 2, 1972, 48114/72
Int. Cl. G01t *1/20*
U.S. Cl. 250—483 **10 Claims**



1. An X-ray image intensifying device for radiography comprising the following sequential layers:
   A. A supporting film base,
   B. A conducting layer which is at least partially transparent to X-rays,
   C. An X-ray sensitive photoconductive layer,
   D. A light opaque layer,
   E. An electroluminescent layer comprising an electroluminescent compound dispersed in a binder,
   F. An at least partially light-transparent electrically conducting layer, and
   G. A protective layer whose thickness is such that the resolving power loss is not greater than 20 percent lower than that of the same element without any protective layer.

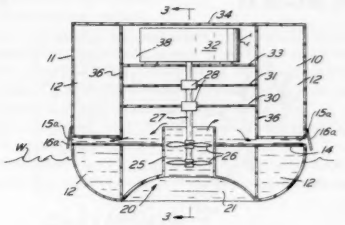
3,870,893

WAVE OPERATED POWER PLANT

Henry A. Mattera, 736 Fern St., Yeadon, Pa. 19050

Filed Oct. 15, 1973, Ser. No. 406,545
Int. Cl. F03b *13/12*
U.S. Cl. 290—53 **4 Claims**

1. A wave operated power plant which comprises
   a vessel having a hull,
   a plurality of flotation and ballast chambers carried within said hull,
   at least one vertically extending tube extending upwardly from the bottom of said hull,
   water deck means contiguous to the hull water line above which said tube terminates,
   a discharge passageway being provided for discharge of water from said water deck means,
   said passageway having at least one port extending through said hull and having an outwardly opening door for permitting water discharge but preventing entry of water from outside said hull,
   water driven members in each said tube having an output shaft, and
   electric generator means connected to each shaft.

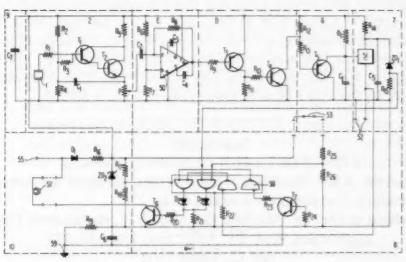


3,870,894

ELECTRONIC SENSOR FOR TRIGGERING SAFETY DEVICES DURING THE CRASH OF VEHICLES

Uwe Brede, Schwaig; Karl-Egon Flach, Cologne-Riehl; Heinz Gawlick, Furth, Bayern; Gunter Hirschmann, Volkach am Main, and Walter Kreibich, Furth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 20, 1973, Ser. No. 334,023
Claims priority, application Germany, Feb. 19, 1972, 2207831
Int. Cl. H01h *35/14*
U.S. Cl. 307—9 **34 Claims**



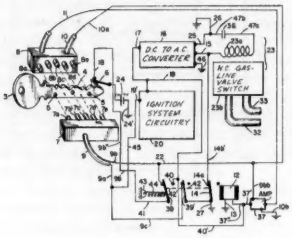
1. An electronic sensing system for triggering the actuation of a safety mechanism during a vehicle collision comprising acceleration pickup transducer means responsive to vehicle shock acceleration for providing an output signal indicative thereof, evaluating and safety triggering circuit means for processing the output signal of the transducer means in accordance with predetermined dynamic deformation characteristics of the vehicle, said evaluating and safety circuit means including threshold means providing first and second threshold values and for providing triggering output signal upon the output signal of said transducer means exceeding the first and second threshold values, and ignition circuit means responsive to the triggering signal for actuating the safety mechanism.

3,870,895

AUTOMOTIVE ANTI-THEFT DEVICE

Jacob Lax, 850 44th St., Brooklyn, N.Y. 11220, and Sandor Goldner, 4308 10th Ave., Brooklyn, N.Y. 11219

Filed Oct. 9, 1973, Ser. No. 404,270
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 AT **8 Claims**



1. An automotive anti-theft device comprising in combination ignition switch means (A) including (a) circuitry for an automotive ignition system and (b) a switch for opening and closing alternately the circuitry, and (B) defining a receptacle structure, receivable of a switch key of predetermined coded structure; a switch key means having said predetermined coded structure such that the switch key means is operatively insertable into the receptacle structure and will close and open the circuitry; a converter means for converting direct current to alternating current, having DC-input and output terminals and having AC-terminals, the DC-input and output terminals being operatively connected to said circuitry; a gas line relay valve-switch means mountable in series within an automotive gas-line and including an alternating-current switchrelay operatively responsive to solely alternating current, the alternating-current switch-relay being operatively connected between said AC-terminals; grounding-out means connected to said AC-terminals for separately grounding-out each of the AC-terminals, the grounding-out means including a grounding-out relay-switch with power circuitry connected to a relay thereof, the grounding-out relay-switch being adapted to alternately close and open grounding-out circuitry, in electrical series with at least one of the AC-terminals for making and breaking ground alternately of at least one of said AC-terminals; and said switch key means having further coded structure for turning alternately off and on relay-activating power to the relay of said grounding-out relay-switch.

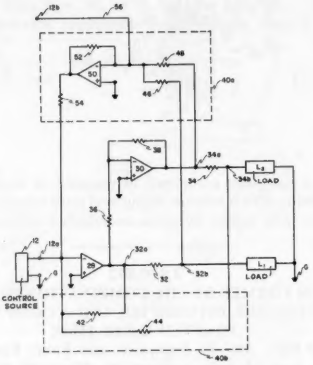
3,870,896

CONTROLLABLE CURRENT SOURCE

Frederick Kiko, Sheffield Village, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Division of Ser. No. 301,968, Oct. 30, 1972, abandoned. This application Sept. 11, 1973, Ser. No. 396,225
Int. Cl. G05f *1/10*
U.S. Cl. 307—34 **8 Claims**

1. In a circuit for generating two currents which are substantially equal and opposite and which have magnitudes that are substantially independent of the impedance of the circuitry to which the currents are applied, the combination of, a circuit input, first and second circuit outputs, first and second current generating means each having inverting input means and output means, first and second current sampling means for generating respective signals which vary in accordance with the currents at respective circuit outputs, means for connecting the input means of said first generating means to said circuit input, means for connecting said first sampling means between the output means of said first generating means and said first circuit output, means for connecting the input means of said second generating means to the output means of said first generating means, means for connecting said second sampling means between the output means of said second generating means and said second circuit output, feedback means for energizing the input means of said first generating means with a feedback signal indicative of the current through



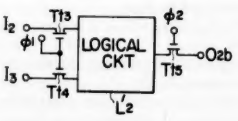
both said first and said second sampling means and means for connecting said feedback means to said first and second sampling means and to the input means of said first generating means.

3,870,897

DIGITAL CIRCUIT

Yoshikazu Hatsukano; Kosei Nomiya, and Hiroto Kawagoe, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1973, Ser. No. 332,522
Claims priority, application Japan, Feb. 14, 1972, 47-14805
Int. Cl. H03k *19/08, 19/36;* **G11c** *11/34*
U.S. Cl. 307—208 **10 Claims**



1. A circuit comprising:
at least two input terminals to which at least two information signals are to be respectively applied;
circuit means, coupled to said at least two input terminals, for providing an output signal which is a function of said at least two input signals applied thereto;
an output terminal, coupled to said circuit means, from which said output signal may be derived;
first and second delay means, connected between said input terminals and said circuit means, for controlling the application of information signals to said circuit means in accordance with a first pulse signal applied thereto; and third delay means, connected between said circuit means and said output terminal, for controlling the reading out of the said output signal, in accordance with a second pulse signal having a pulse difference relative to said first pulse signal.

2. A circuit according to claim 1, wherein the phase difference of said second pulse signal relative to said first pulse signal is at least equal to the delay effected by the operation of said circuit means on information signals applied thereto.

3,870,898

FREQUENCY-TO-VOLTAGE CONVERTER

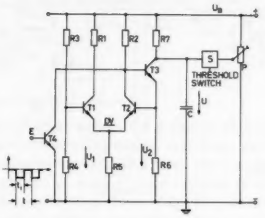
Wolfgang Hoehn, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,664

Claims priority, application Germany, Sept. 8, 1973, 2345421

Int. Cl. G01r *23/06*

U.S. Cl. 307—233 **7 Claims**



1. A monolithic integrable frequency-to-voltage converter in which a voltage is generated across a capacitor as a function of the pulse duty cycle of a square-wave input signal, said voltage being compared in a threshold circuit with a supply-voltage-dependent threshold value, said converter comprising:
a supply-voltage source having a first terminal supplying a given polarity supply voltage and a second terminal which is grounded;
a symmetrical differential amplifier including a first amplifying transistor and a second amplifying transistor connected between said first and second terminals;
a first voltage divider connected between said first and second terminals, said voltage divider having a junction point connected to the base of said first transistor;
a second voltage divider including a first resistor connected between said second terminal and the base of said second transistor, a first additional transistor having its emitter connected to the base of said second transistor, its base connected to the collector of said second transistor, and its collector connected by a second resistor to said first terminal;
said capacitor being connected between the collector of said first additional amplifier and one of said first and second terminals; and
an input circuit for said square-wave input signal to apply said input signal to the collector of said second transistor and the base of said first additional transistor.

3,870,899

RECEIVER PROTECTION CIRCUIT APPARATUS

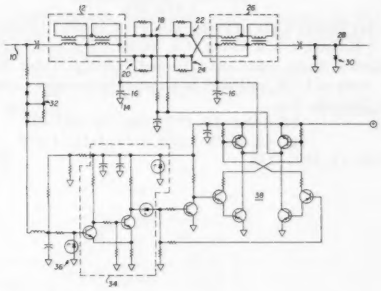
Cornelis Daniel Stoffer, Markham, Ontario, Canada, assignor to Rockwell International Corporation, Dallas, Tex.

Filed Dec. 14, 1973, Ser. No. 424,995

Int. Cl. H03k *5/70, 17/74*

U.S. Cl. 307—235 **3 Claims**

1. Signal decoupling means comprising, in combination:
apparatus input means for supplying an input signal;
first transformer means including primary winding means for receiving a signal and tapped secondary winding means;
voltage level sensing means, including input and output means, for providing in the alternative a first output when signals applied to said input means thereof are less than a predetermined value and a second output when signals applied to said input means thereof are greater than said predetermined value, said voltage level sensing means comprising from input means to output means,
zener diode means,
Schmitt Trigger means,
switching amplifier means, and
means connecting each of said above named means between said input means and said output means of said voltage level sensing means for providing said second output only when input signals are greater than said predetermined value;
apparatus output means;
means connecting said apparatus input means to said first transformer means and to said input means of said voltage level sensing means for supplying input signals thereto;
secondary transformer means including tapped primary winding and secondary winding means;
means connecting said tapped secondary winding means to said apparatus output means;
diode means connected between the ends of said secondary winding means of said first transformer means and said



primary winding means of said secondary transformer means, said diode means comprising,
a first pair of diodes with common junctions connected together and the remaining junction of each diode connected to an end of said tapped secondary winding means and said tapped primary means, respectively, and a second pair of diodes similarly connected to the other end of each of said tapped winding means, and
the connection of said output means of voltage level sensing means is to the common junction of each of said diode pairs; and
means connecting said output means of said voltage level sensing means to the taps of said winding means of said first and second transformer means and to said diode means, said diode means permitting signal passage when said voltage level sensing means provides the first output and restricting signal passage when said voltage level sensing means provides the second output.

3,870,900

PHASE DISCRIMINATOR HAVING UNLIMITED CAPTURE RANGE

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

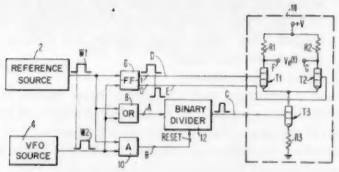
Filed Nov. 12, 1973, Ser. No. 415,054

Int. Cl. H03d *13/00*; **H03k** *5/20*

U.S. Cl. 307—232 **19 Claims**

1. A phase discriminator responsive to the delay between two input signals for providing an output waveform indicative both of the relative occurrence of said signals and of the difference in said delay comprising:
circuit means responsive to said input signals for generating an output signal having a duration equal to the delay between said pulses;
logic means responsive to said input signals for generating an output signal identifying the relative occurrence of said signals; and

current switch means responsive to said logic means for generating said output waveform having a potential level indicative of the relative occurrence of said input signals,



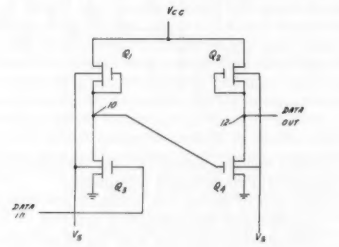
and responsive to said circuit means for generating said output waveform for a duration indicative of the delay between said input signals.

3,870,901

METHOD AND APPARATUS FOR MAINTAINING THE CHARGE ON A STORAGE NODE OF A MOS CIRCUIT

Kent F. Smith, Salt Lake City, and Robert J. Huber, Bountiful, both of Utah, assignors to General Instrument Corporation, Newark, N.J.

Filed Dec. 10, 1973, Ser. No. 423,422
Int. Cl. H03k *3/286, 3/33;* **G11c** *11/38*
U.S. Cl. 307—238 **27 Claims**



4. A method of maintaining the charge on a storage node of a MOS circuit whose input is connected to an internal storage node, said circuit being of the type having first and second inverter circuits connected in series each of which utilizes a depletion mode transistor as a load device situated between a voltage source and the storage node thereof, the method comprising the steps of charging the storage node of the first inverter to a given voltage level if a data input of a given polarity is present, reverse biasing the substrate to isolate the storage nodes respectively, permitting the charge on the storage node of the first inverter to decay if same was originally charged, and removing the reverse bias to render the depletion mode transistors conductive while some residual charge still remains on said storage node and thereby effective to recharge the storage node of the first inverter if the input signal is still present, said residual charge being effective to prevent charging of the storage node of the second inverter.

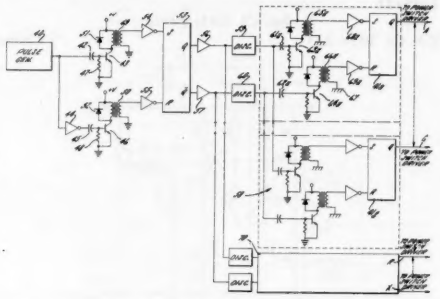
3,870,902

BUFFER CIRCUIT FOR PULSE TRANSMISSION

Eiichi Takarada, 1423 Vassar Rd., Rockford, Ill. 61103

Filed Nov. 6, 1973, Ser. No. 413,213
Int. Cl. H03k *17/00*
U.S. Cl. 307—247 **4 Claims**

1. In an EDM power supply having a pulse generator and a power switch driver, a buffer circuit comprising in combination a pair of pulse transformers each having a primary and a secondary for coupling signals between the pulse generator circuit and the power switch driver circuit while maintaining their electrical isolation, a pair of electronic switches each having a control circuit and a load circuit, one of the transformer primaries coupled in the load circuit of each of the electronic switches, the first of said switches having its control circuit coupled to the pulse generator, an inverter coupled between the pulse generator and the control circuit of the second of said switches, a flip-flop having a set input coupled



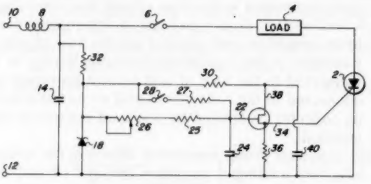
to the secondary of one of the other of the transformers and a reset input coupled to the secondary of the other of the transformers, the flip-flop having an output coupled to the power switch driver, whereby the signal produced by the pulse generator is regenerated by the flip-flop for controlling the electrically isolated power switch drivers.

3,870,903

PHASE CONTROLLED POWER SUPPLY

Leo Ottis Taylor, Alto Loma, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1973, Ser. No. 361,747
Int. Cl. H03k *17/72*
U.S. Cl. 307—252 N **1 Claim**

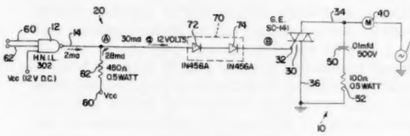


1. A phase controlled power supply circuit comprising a source for supplying an alternating current signal having a desired magnitude to a pair of input terminals, a load device and a silicon controlled rectifier connected in series with said pair of terminals, a gate-signal generating circuit for said silicon controlled rectifier coupled to said terminals and to the gate electrode of said silicon controlled rectifier, said gate-signal generating circuit comprising a unijunction transistor, a resistor, a zener diode coupled across the base electrodes of said unijunction transistor and a firing circuit for said unijunction transistor coupled to the emitter electrode of said unijunction transistor; the base-one electrode of said unijunction transistor is connected directly to said gate electrode of said silicon controlled rectifier and is connected through said resistor to a terminal of said silicon controlled rectifier, a capacitor having a value between 0.1 and 0.5 microfarads connected directly between the base-two electrode of said unijunction transistor and said terminal of said silicon controlled rectifier for varying the firing angle of said silicon controlled rectifier when the magnitude of said alternating current signal varies from said desired magnitude such that substantially the same power is dissipated by said load device even though there are variations in the magnitude of said alternating current signal.

3,870,904
CIRCUIT FOR CONTROLLING A THYRISTOR BY DIRECT CURRENT LOGIC

Delmas A. Schock, Euclid, Ohio, assignor to Mayfran Incorporated, Mayfield Village, Ohio

Filed May 21, 1973, Ser. No. 362,165
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **3 Claims**



1. A direct current circuit for gating a triac used to switch alternating current applied across said triac, said triac having a gate and being in a conductive state when a signal of at least a first voltage and at least a given current is applied to said gate of said triac and a non-conductive condition when a signal of a voltage below a second voltage is applied to said gate, said direct current circuit comprising:

a. a logic gate with an output having a low logic state having a first output voltage above said second voltage and insufficient to positively render said triac non-conductive when said logic gate is shifted to its low logic state and said first output voltage created during the low logic state of said logic gate being less than a third voltage, said logic gate having a high logic state with a second output voltage above said first voltage by at least substantially more than said third voltage to provide a sufficient voltage to render said triac conductive and the output current of said logic gate during said high logic state being less than said given current to provide insufficient current to render said triac conductive;

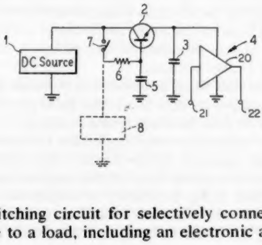
b. circuit means for connecting said logic gate output to said gate of said triac, said circuit means including a voltage drop element connected between said logic gate output and said triac gate and having a maximum voltage drop of approximately said third voltage; and,

c. a current source connected to said logic gate output and between said logic gate output and said voltage drop element for providing additional current to said circuit means, said provided current being added to said output current of said logic gate when in said high state to provide a current summation having a value at least as great as said given current to render said triac conductive when said logic gate is in said high logic state.

3,870,905
SWITCHING CIRCUIT

Hiroyuki Chikazawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1972, Ser. No. 297,409
Claims priority, application Japan, Oct. 20, 1971, 46-96840
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 **10 Claims**

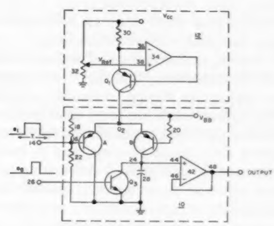


1. In a switching circuit for selectively connecting a d.c. power source to a load, including an electronic amplifier for amplifying an a.c. signal, said circuit having an input terminal adapted to be connected to a first terminal of said d.c. source, an output terminal adapted to be connected to a first terminal of said load, and a common terminal adapted to be connected to a second terminal of said source and to a second terminal of said load, said first terminal, said output terminal and said common terminal all being independent of said a.c. signal, the combination comprising a silicon transistor having base, emitter and collector electrodes, means for connecting said collector electrode to said input terminal, means for connecting said emitter electrode to said output terminal, a series circuit including a resistor and a switch connected between said base electrode and said input terminal, and a capacitor connected between said base electrode and said common terminal.

3,870,906
RAMP/HOLD CIRCUIT

Richard Smith Hughes, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1973, Ser. No. 372,443
Int. Cl. H03k *4/50, 5/18, 17/14*
U.S. Cl. 307—261 **2 Claims**



1. An electronic circuit for converting a signal pulse width into a voltage amplitude, comprising:

a differential amplifier including first and second transistors having commonly connected emitters, wherein each transistor provides a current path through said amplifier;

an input coupled to the base of said first transistor for receiving said pulse signal, wherein the current path through said amplifier is responsive to said signal;

a current source coupled to said commonly connected emitters providing a constant value of electrical current to said amplifier, including a third transistor, and an operational amplifier having its output directly connected to the base of said third transistor, wherein the collector of said third transistor is connected to said commonly connected emitters, its emitter and one input of said operational amplifier are coupled in common to a d.c. voltage source, and the operational amplifiers other input is coupled to a controllable reference voltage source;

charge storing means coupled to the collector of said second transistor for storing an electrical charge that is dimensionally associated with the signal pulse width received by said input; and

discharging means coupled to said charge storing means for selectively providing a discharge path for said storing means;

wherein the current path of the current from said constant current source is through said second transistor to said charge storing means during the period said pulse signal is received by said input.

3,870,907

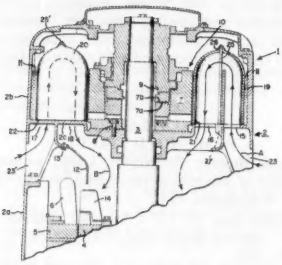
LUBRICANT COOLING APPARATUS FOR A VERTICAL ELECTRIC MOTOR

Orville William Hoffman, Los Gatos, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,563

Int. Cl. H02k *5/18*

U.S. Cl. 310—64 **6 Claims**



1. Lubricant cooling apparatus for a vertical electric motor having a hollow metal housing, a stator rigidly mounted in the housing, a drive shaft rotatably mounted in the housing, a rotor supported on said shaft, a thrust bearing having a first bearing surface mounted in fixed relationship to said housing and a second bearing surface mounted in fixed relationship to said shaft to rotate therewith, said first bearing surface being positioned to support in sliding, rotatable relationship, the second bearing surface when the drive shaft is in its operative position, wall means defining a cup-shaped lubricant-receiving well surrounding said thrust bearing, and a body of liquid lubricant positioned in said well in lubricating and heat absorbing contact with said thrust bearing, said lubricant cooling apparatus comprising means defining a plurality of air passageways in a bottom surface of said wall means, a plurality of hollow, open-ended, generally U-shaped air ducts, both open ends of each of said ducts being mounted in sealing relationship on the bottom surface of the wall means defining said lubricant well, thereby to place the open ends of each of the ducts, respectively, in alignment with one of said air passageways, said ducts being of sufficient length to extend at least to the upper surface of said lubricant when the motor is in its vertical operation position thereby to position a major part of the length of both legs of each of the ducts in heat exchange relationship with the lubricant in said well, air inlet and exhaust means in said housing for moving air into one leg and out of the other leg of each of the respective ducts, and a plurality of gaskets each mounted, respectively, in sealing relationship around one of said air passageways between the open end of one of said ducts and the bottom surface of said wall means.

3,870,908

BELL HOUSINGS FOR MOUNTING ELECTRIC MOTORS

David Button, West Suffolk, and Philip Ward Hopkins, Norfolk, both of England, assignors to U.C.C. International Limited, Thetford, Norfolk, England

Filed Dec. 17, 1973, Ser. No. 425,634

Claims priority, application Great Britain, Jan. 12, 1973, 1725/73

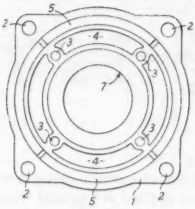
Int. Cl. H02k *5/00*

U.S. Cl. 310—91 **3 Claims**

1. A bell housing, for securing between an electric motor and a structure, comprising an integrally formed one-piece body which includes:

i. an intermediate tubular portion having first and second ends

ii. a first coaxial mounting flange portion extending from said first end of said intermediate portion and including a plurality of sets of holes, the holes of each set being arranged at the same radius from the common central axis of the first coaxial mounting flange portion and the intermediate tubular portion, the radius of each set of



holes being different from the radius of each other set of holes, thereby to permit the securing to said first coaxial mounting flange portion of electric motors having mounting holes of selectively different corresponding radius

iii. a second coaxial mounting flange portion extending from said second end of said intermediate portion and including a set of holes for mounting said flange to a structure.

3,870,909

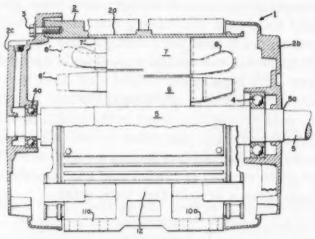
MOUNTING MEANS FOR STANDARDIZED DYNAMOELECTRIC MACHINES

William Walrath Pangburn, Pattersonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,454

Int. Cl. H02k *5/00*

U.S. Cl. 310—91 **4 Claims**



1. A dynamoelectric machine comprising; a housing having an elongated, hollow center portion and a pair of end caps that are mounted respectively on opposite ends of said center portion, a pair of bearings mounted respectively on said end caps, a drive shaft having a shoulder adjacent one of its ends, said drive shaft being rotatably mounted on said bearings with one end of said shaft extending through one of the end caps and beyond the housing, a rotor element mounted on the drive shaft for rotation therewith, a stator assembly mounted within said housing around the rotor element,

two pairs of feet mounted in spaced apart relation on the housing center portion,

each of said feet being positioned to coincide generally with the respective corners of a rectangular plane tangential to the base of said housing center portion,

wall means defining two apertures through each of said feet, all of the apertures in the two feet on respectively opposite sides of a plane through the longitudinal axis of said drive shaft being positioned in alignment with one another, with the centers of the four outermost apertures defining the corners of a first rectangle and the centers of

the four innermost apertures defining the corners of a second rectangle, and

the improvement wherein the midpoint of a straight line extending between the centers of the two apertures nearest the end of said drive shaft extending through said one end cap is spaced a pre-determined distance BA from the shoulder on said drive shaft and is spaced a fixed distance **2F** from the midpoint of a straight line extending between the centers of the two apertures at the corners of said second rectangle furthest therefrom, and the sides of said first rectangle parallel to the longitudinal axis of the drive shaft are each a pre-determined length **2F'**,

said fixed distance **2F** and said pre-determined length **2F'** being preselected dynamoelectric machine standard dimensions that are both related to different standard frame size designations that correspond to a common standard pre-determined distance BA.

3,870,910
ELECTRIC MOTOR PUMP UNIT

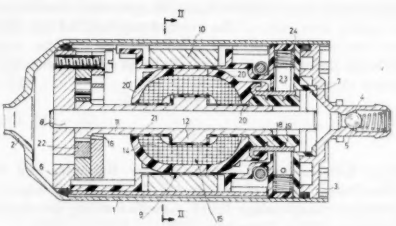
Paul Fussner, Sindelfingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 30, 1973, Ser. No. 420,706

Claims priority, application Germany, Jan. 30, 1973, 2304360

Int. Cl. H02k *7/14*

U.S. Cl. 310—66 **10 Claims**



1. In a pump unit, particularly for liquid fuels, a combination comprising a housing; a pump in said housing; an electromotor located in said housing for driving said pump and including a unitary mounting element of sintered material composed of a sleeve-shaped body integrally provided with a plurality of spokes projecting outwardly therefrom, and with a coupling portion which is coupling with said pump for driving the same, a motor armature comprising said spokes and armature windings mounted on said spokes, and a collector mounted on said sleeve-shaped body; and means mounting said sleeve-shaped body and the elements mounted thereon for rotation.

3,870,911
WHEEL SPEED DETECTOR FOR VEHICLES

Koichi Toyama, and Koichi Taniguchi, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

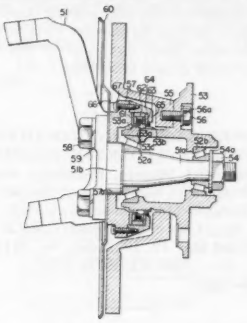
Filed June 19, 1973, Ser. No. 371,499

Claims priority, application Japan, June 21, 1972, 47-73919

Int. Cl. H02k *17/42*

U.S. Cl. 310—155 **1 Claim**

1. A wheel speed detector for vehicles comprising: a non-rotatable axle, a wheel hub coaxially rotatably mounted on said axle through bearings, said wheel hub being made of magnetic material, brake disc means connected to the outer periphery side of said wheel hub in a coaxially rotatable relation to said axle, a stationary plate directly snugly fitted on the outer peripheral surface of said axle in a coaxial relation therewith, electric power generating means secured to said stationary plate and disposed in an enclosure defined by the outer surface of said wheel hub and the inner surface of said brake disc means, said generating means including annular coil means with its turns forming concentric circles with respect to said axle and annular permanent magnet means disposed around the outer periphery of said coil means, and a plurality of serrations disposed in an opposite relation with respect to said generating means and directly provided on the outer peripheral surface of said wheel hub.



3,870,912
SMOOTH-CORE ROTOR FOR A SYNCHRONOUS ELECTRIC MACHINE

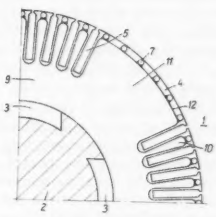
Eberhard Kipke, and Erich Losensky, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 4, 1973, Ser. No. 357,259

Claims priority, application Germany, May 18, 1972, 22249123

Int. Cl. H02k *3/16*

U.S. Cl. 310—183 **4 Claims**



1. A smooth-core rotor for a synchronous electric machine comprising a plurality of excitation windings; a rotor stack consisting of a stack of rotor laminations, said rotor stack defining respective longitudinal rotor end faces and defining a plurality of radial pole projections for corresponding ones of said excitation windings, said rotor stack further defining a plurality of slots disposed on respective sides of each one of said pole projections for accommodating the turns of the corresponding excitation winding, each two mutually adjacent ones of said slots defining a rotor tooth between them; and a damper arrangement including a plurality of damper bars disposed on said rotor stack, a portion of said damper bars being arranged at the rotor teeth and the remainder of said damper bars being arranged at the pole projections of said rotor stack, and a steel pressure plate disposed at each longitudinal end face of said rotor stack for clamping the stack of rotor laminations together, said steel pressure plates each defining a plane and being configured to have pressure fingers at corresponding ones of the rotor teeth and to have an edge portion at each one of said pole projections, said pressure

fingers and said edge portions being in the plane of said plate and extending into the immediate vicinity of said damper bars, each of said damper bars of said portion thereof being individually welded to corresponding ones of said pressure fingers and each of the damper bars of said remainder thereof being individually welded to the edge portion corresponding to the pole projection whereat the damper bar is arranged whereby said pressure plates short circuit all of said damper bars to each other at each of said end faces.

3,870,913

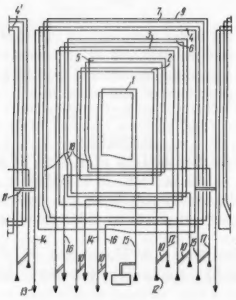
ROTOR WINDING DIRECTLY COOLED BY LIQUID FOR USE IN NON-SALIENT POLE SYNCHRONOUS MACHINE

Aron Beniaminovich Shapiro, Basseinaya ulitsa 53, kv. 70; Vladimir Pavlovich Chernyavsky, Pulkovskaya ulitsa 17, kv. 185, and Ibragim Akhmedovich Kadi-Ogly, ulitsa Chaikovskogo 15, kv. 24, all of Leningrad, U.S.S.R.

Filed May 18, 1973, Ser. No. 361,626

Int. Cl. H02k *3/04*

U.S. Cl. 310—208 **13 Claims**



1. A rotor winding directly cooled by liquid, for use in the slots of a rotor of a non-salient pole synchronous machine, said rotor winding comprising pole windings including one group of concentrically disposed coils wound in one and the same direction of each pole and a second group of concentrically disposed coils wound in one and the same direction of each pole, said second group of coils being disposed in the same slots as said first group of coils, lead-outs for said coils of both groups arranged axially at one side of the rotor and extending beyond the end portions thereof, said coils of one group being disposed in the lower portions of the slots nearest to the rotor axis while said coils of the other group are disposed in the upper portions of the slots nearest to the outer surface of the rotor, the coils of each pole being in electrical series connection by alternately switching-in one coil of each group beginning with the smallest coil in one group and the largest coil in the other group, and means interconnecting the lead-outs of the coils.

3,870,914

CURRENT COLLECTION MEANS FOR ELECTRIC MOTORS

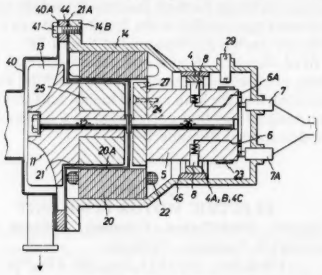
Alan J. Walker, 387 Maidstone Rd., Gillingham, England

Continuation-in-part of Ser. No. 157,576, June 28, 1971, Pat. No. 3,751,698. This application Feb. 26, 1973, Ser. No. 335,469

Int. Cl. H02k *13/10*

U.S. Cl. 310—219 **3 Claims**

1. An electric motor comprising a stator having a plurality of inductive coils for generating a rotating magnetic field, an armature rotatably driven by said magnetic field, commutator means including fixed contacts electrically connected with each inductive coil, rotatable contacts connected to a source of voltage, and rotation means for rotating said rotatable contacts in succession with said fixed contacts whereby said coils of said stator are successively connected to the voltage source: the improvement comprising in that the number of fixed contacts is an integral multiple of the number of coils of said stator; in that each fixed contact comprises an arcuate segment mounted on a common insulating ring; in that each rotatable contact comprises a rotatable brush the polarity of which alternates as it rotates in a circumferential direction; in that said rotation means comprises an auxiliary electric motor



having an auxiliary induction rotor mounting said rotatable contacts; in that the stator of the electric motor serves as an auxiliary stator for the auxiliary motor; and, in that the auxiliary induction rotor carries a rotor winding which is electrically connected to the voltage source whereby said auxiliary electric motor uses part of the current supplied to the electric motor such that an increase in current to said rotor winding decreases the rotational speed of the auxiliary rotor and the electric motor.

3,870,915

X-RAY TUBE

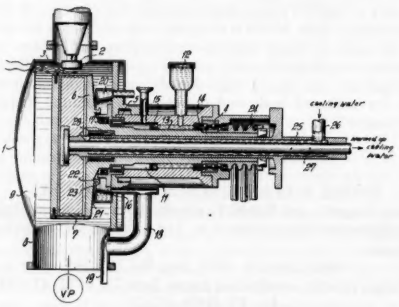
Eckart Kussel, Duren; Heinz-Gunther Haubold, and Peter Wombacher, both of Julich, all of Germany, assignors to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Feb. 20, 1974, Ser. No. 444,255

Claims priority, application Germany, Feb. 21, 1973, 2308508

Int. Cl. H01j *35/10*

U.S. Cl. 313—32 **4 Claims**



1. An x-ray tube which includes: housing means defining first high vacuum chamber means and having a connecting section connectable to a vacuum pump, hollow shaft means extending through said housing means and into said first high vacuum chamber means, means drivingly connected to said shaft means for rotating the same, bearing means rotatably supporting said shaft means, a rotation symmetric anode located in said first high vacuum chamber means and detachably connected to said hollow shaft means for rotation therewith,

said hollow shaft means having associated therewith conduit means leading to and from said anode and being connectable to a supply of cooling fluid and a discharge for respectively conveying cooling fluid to and from said anode, said bearing means including a first bearing and a second bearing closer to said anode than said first bearing, a prevacuum chamber surrounding a portion of said hollow shaft means and having said second bearing at least partially arranged therein, second high vacuum chamber means arranged between said prevacuum chamber and said first high vacuum chamber means, first sealing means, and second sealing means, said second high vacuum chamber means being separated from said prevacuum chamber by said first sealing means and being separated from said first high vacuum chamber means by at least a portion of the surface of said rotatable anode and by a wall of said second sealing means which wall is close to and substantially parallel to said anode surface, said second high vacuum chamber means extending partly over said first sealing means, and that wall of said second high vacuum chamber means which is located opposite said first sealing means simultaneously forming a wall of a cooling passage adapted to be connected to a supply of cooling fluid to be passed therethrough.

3,870,916

X-RAY TUBE

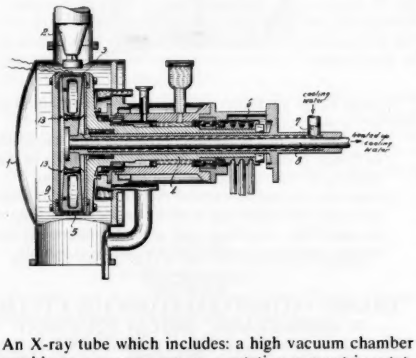
Eckart Kussel, Duren; Heinz-Gunther Haubold, and Peter Wombacher, both of Julich, all of Germany, assignors to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Feb. 20, 1974, Ser. No. 444,256

Claims priority, application Germany, Feb. 21, 1973, 2308509

Int. Cl. H01j *35/10*

U.S. Cl. 313—32 **7 Claims**



1. An X-ray tube which includes: a high vacuum chamber connectable to a vacuum pump, a rotation-symmetric rotatable anode having a hollow space therein and being rotatably arranged in said high vacuum chamber, a rotatable hollow shaft disengageably connected to said anote for rotating the same, conduit means associated with said hollow shaft and communicating with the hollow space of said anode for respectively conveying cooling fluid to and from said anode, a rotatable distributing member arranged within said hollow space of said anode and coaxially therewith and being rotatably connected to said anode including lateral wall means and ring means of a U-shaped cross section the central portion of which forms the peripheral mantle surface of said anode and the legs of which have said lateral wall means detachably connected thereto, sealing means interposed between said legs and said lateral wall means, and a cathode arranged relative to said anode so that said mantle surface of said anode is within the region of the electron beams emitted by said cathode.

3,870,917

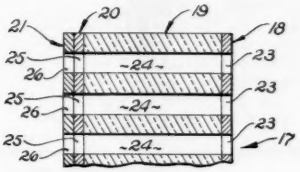
DISCHARGE DEVICE INCLUDING CHANNEL TYPE ELECTRON MULTIPLIER HAVING ION ADSORPTIVE LAYER

John J. Cuny, Granada Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 141,850, May 10, 1971, abandoned. This application Feb. 16, 1973, Ser. No. 333,437

Int. Cl. H01j *43/28, 39/04*

U.S. Cl. 313—105 **1 Claim**



1. An electron tube multiplier device comprising: an evacuated envelope, electrode means positioned within one end of said envelope for emitting primary electrons, a dielectric plate positioned in the path of said primary electrons and having a plurality of holes extending completely therethrough from a first input side thereof to a second output side opposite said first side, said plate holes having secondary electron emissive resistive surfaces emitting secondary electrons in response to impingement of said primary electrons, electrode means positioned at the other end of said envelope spaced from and facing said second output side for receiving said secondary electrons and emitting positive ions in response thereto; a first electrode layer on said first side having a plurality of holes in registration with said holes in said plate, a conductive layer on said second side having a plurality of holes in registration with said holes in said plate, a positive ion adsorption second electrode layer including titanium metal on said conductive layer on said second side, said ion adsorption layer having a plurality of holes extending completely therethrough in registration with said plate holes, and said conductive layer holes said ion adsorption layer receiving and adsorbing said positive ions from said electrode means at said other end, and means for applying potentials between successive electrodes including said electrode means emitting primary electrons and said first and second electrode layers and said electrode at said other end.

3,870,918

IGNITION PLUG WITH AUXILIARY ELECTRODE

Katsuyuki Senda, Toyota, and Mamoru Kobashi, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichen-ken, Japan

Filed Sept. 5, 1973, Ser. No. 394,523

Claims priority, application Japan, Dec. 22, 1972, 47-128262

Int. Cl. H01t *13/02*

U.S. Cl. 313—131 R **8 Claims**

1. An ignition plug, comprising:

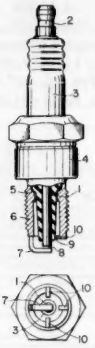
a center electrode;

an insulating member surrounding at least a portion of said center electrode;

a mounting member surrounding at least a portion of said insulating member and adapted for mounting said ignition plug in an operating condition;

a ground electrode coupled to said mounting member and disposed adjacent to and spaced from an end portion of said center electrode to form a primary spark gap therewith; and an auxiliary electrode defining a secondary

spark gap between the end portions of said insulating and mounting members adjacent said primary spark gap,



wherein said secondary spark gap is selected to be smaller than said primary spark gap.

3,870,919

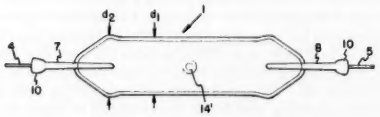
DISCHARGE LAMP HAVING BLOW-MOLDED ARC TUBE ENDS

Wayne R. Hellman, Euclid; Klaus Gottschalk, Solon, and Edward C. De George, South Euclid, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 28, 1973, Ser. No. 374,566

Int. Cl. H01j *61/33*

U.S. Cl. 313—220 **4 Claims**



1. A high intensity electric discharge lamp comprising: a filling of mercury which is substantially all vaporized in operation, metal halide in excess of the quantity vaporized and an inert gas;

a generally cylindrical arc tube formed of a vitreous quartz-like material and being a length of tubing of a given diameter;

pinched ends on said tube having inleads sealed therethrough supporting electrodes on their distal ends;

at least one end portion of said arc tube having a length not substantially greater than the diameter of said tubing, being belled and expanded in diameter not over 10% beyond the diameter of said tubing to a constant size in order to achieve uniform characteristics in a line of lamps notwithstanding variations in tubing diameter.

3,870,920

ELECTRIC INCANDESCENT LAMP

Dirk Jules Remi De Fraeye, and Jan Alfons Catharina Mewissen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 390,169

Claims priority, application Netherlands, Sept. 13, 1972, 7212381

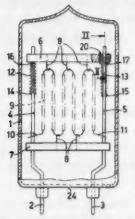
Int. Cl. H01j *1/94, 19/48*

U.S. Cl. 313—278 **5 Claims**

1. An incandescent lamp comprising:

two longitudinal supports disposed within said envelope,

one transverse support, said transverse support being manufactured from an insulating material and carried on each of the longitudinal supports, a wire helix fixed to said transverse support and a coil spring fixed to said



longitudinal support and disposed in coaxial relationship with at least an axial portion thereof engaging at least an axial portion of said coil spring in interspersed relation to prevent axial movement therebetween.

3,870,921

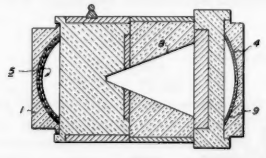
IMAGE INTENSIFIER TUBE WITH IMPROVED PHOTOEMITTER SURFACE

James W. Burns, Altadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1973, Ser. No. 400,296

Int. Cl. H01j *1/14, 19/06*

U.S. Cl. 313—346 R **8 Claims**



1. In an image intensifier tube having an amorphous optical surface, a photocathode comprising:

a thin film of a first compound prepared from the elements of Group II and Group VI of the periodic table deposited directly on said amorphous optical surface, and

a layer of a second compound prepared from the elements of Group III and Group V of the periodic table deposited on said film, said first and second compounds having closely matched crystallographic lattice constants.

3,870,922

GRAPHIC PATTERN GENERATION FOR A TV-LIKE SCANNED-GRAPHIC DISPLAY EQUIPMENT

Masamichi Shutoh, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 355,284

Claims priority, application Japan, May 2, 1972, 47-44319; May 16, 1972, 47-48873

Int. Cl. H01j *29/70*

U.S. Cl. 315—383 **12 Claims**

1. A graphic pattern generator for a TV-like line by line scanned-graphic display equipment capable of displaying a distinct contrasting sharply graphic pattern contrasting sharply with the background, comprising:

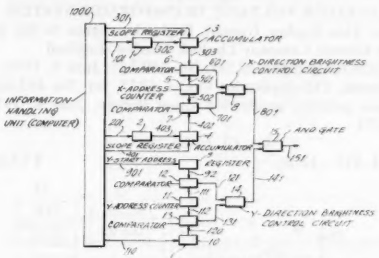
first and second slope registers (1,2) for termporarily storing values representing slopes of a pair of line segments defining at least a portion of the graphic pattern to be displayed;

accumulators (3,4) for adding the contents stored in said registers to X-coordinates of starting points of the pair of line segments, respectively, as each scanning line is generated, thereby generating output signals representing the

X-coordinates of the two points at which the pair of line segments intersect the scanning line being generated;

X-address counter means (**5**) for generating a count representing the position in the X-direction in a display surface of each scanning line as the line is being generated, and comparators (**6,7**) for comparing the contents of the X-address counter means with the contents of the accumulators to produce coincidence signals representing said two points of intersection of a scanning line with the line segments;

means (**8**) for generating an X-direction-brightness-gate signal for each scanning line in response to the coincidence signals, the brightness-gate signal being supplied to display the bright or dark graphic pattern in the dark or bright background, respectively;



means including registers (**9,10**) for temporarily storing therein maximum and minimum values of Y-coordinates of the pattern to be displayed;

a Y-address counter (**11**) for generating a count representing the scanning position in the Y-direction in the display surface as the scan progresses scan line by scan line, and comparators (**12,13**) for comparing the content of the Y-address counter with the contents of the registers (**9** and **10**), to develop coincidence signals representing the maximum and minimum values of the Y-coordinates of the pattern to be displayed;

means (**14**) for generating a Y-direction-brightness-gate signal in response to the coincidence signals obtained from the Y-direction comparators (**12** and **13**); and an AND gate circuit (**15**) for producing an output signal upon simultaneous receipt of the X- and Y-direction-brightness-gate signals.

3,870,923
MAGNETRON WITH AN IMPROVED TUNING MECHANISM

Yves Peyrard, and Jean-Claude Renault, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 26, 1973, Ser. No. 427,500

Claims priority, application France, Dec. 29, 1972, 72.46905

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.55 **4 Claims**

1. A magnetron comprising:

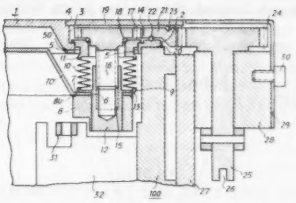
a cylindrical body;

N cavities with electrically conductive walls formed in said body;

two covers, closing off the ends of said body in a vacuum-tight fashion, thus delimiting an enclosure which is maintained under vacuum in operation;

at least N electrically conductive tuning cores, said tuning cores being attached to a bearer, said bearer being carried by one of said covers;

means for translating said bearer in a direction substantially parallel to the axis of said body, simultaneously on three points distributed substantially at the periphery of said bearer, said tuning cores thus penetrating into said cavities through a height depending upon the magnitude of the translation of said bearer;



and sealing means for maintaining the vacuum in the enclosure during said translation.

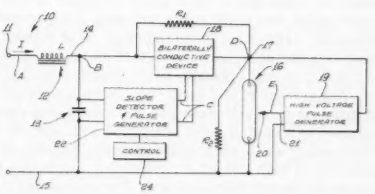
3,870,924
LIGHT SOURCE WITH OPTIMIZED FLASH ENERGY INPUT TO GAS TUBE

James G. Helmuth, Monrovia, Calif., assignor to Chadwick-Helmuth Electronics, Inc., Monrovia, Calif.

Filed June 19, 1973, Ser. No. 371,396

Int. Cl. H05b *37/00*

U.S. Cl. 315—200 A **8 Claims**



1. Flasher circuitry, comprising

a. an A.C. source and a discharge capacitor electrically connected to the source, via a series inductor,

b. a gas discharge lamp,

c. a gate controlled, bilaterally conductive device electrically connected between the capacitor and lamp,

d. a high voltage pulse generator electrically connected to the output side of said device, and an electrode proximate the lamp and coupled to the generator output to be responsive to high voltage pulse generation to assist in ionizing the lamp gas, and

e. input control circuitry coupled in voltage sensing relation with the discharge capacitor and in controlling relation with said device to control the conduction timing thereof in relation to occurrence of capacitor peak or near peak voltage to thereby optimize flash energy input from the capacitor to the lamp via said device, said input control circuitry comprising signal processing means including differentiating circuit means coupled to said capacitor to differentiate a signal derived from the capacitor, and means coupled to said processing means to effect production of a pulse in response to decrease of the ouput of the differentiating circuit means to a predetermined low value, said pulse applied in said controlling relation to said device.

3,870,925
EARTH GRID

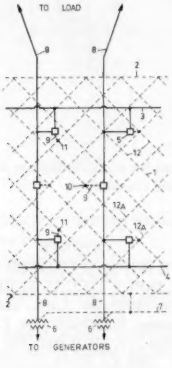
Richard Meredith Huey, Sydney, and Krishna Rajaratnam, Wollongong, both of New South Wales, Australia, assignors to Unisearch Limited, Sidney, New South Wales, Australia

Filed May 1, 1974, Ser. No. 465,930

Claims priority, application Australia, May 4, 1973, 3206/73

Int. Cl. H02b *1/16*

U.S. Cl. 317—9 R **4 Claims**



1. An earth grid, for earthing electrically conductive structures associated with at least one array of parallel bus bars of feeders, or a plurality of such arrays arranged at right angles to each other, said earth grid comprising a horizontal planar substantially regular parallelogrammatic mesh formed by two intersecting and interconnected sets of mutually parallel earth grid conductors and a plurality of electrically conductive earth risers, one or more of said earth risers being connected to each said structure from said mesh and said mesh being electrically connected to a neutral point associated with said bus bars or feeders and/or earth wherein the mutually parallel earth grid conductors of each said set are oriented in a direction forming an angle of between thirty and sixty degrees with the direction of said bus bars or feeders.

3,870,926
CAPACITOR VOLTAGE TRANSFORMER SYSTEM

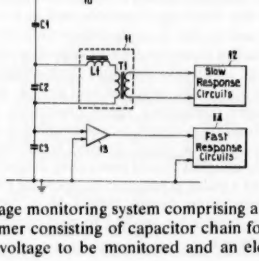
Michael Alan Hughes, Gnosall, England, assignor to The English Electric Company Limited, London, England

Continuation-in-part of Ser. No. 207,039, Dec. 13, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,804

Claims priority, application Great Britain, Dec. 18, 1970, 60147/70

Int. Cl. H02h *7/16*

U.S. Cl. 317—12 B **6 Claims**



1. A high voltage monitoring system comprising a capacitor voltage transformer consisting of capacitor chain for connection across the voltage to be monitored and an electromagnetic transformer connected across a capacitor at the low potential end of the chain, the output produced by said transformer constituing a first output which follows closely the voltage to be monitored under steady state conditions thereof, a slow response circuit connected to said first output to respond to changes in the voltage to be monitored, an additional impedance connected in the capacitor chain, the output produced by the additional impedance constituting a second output which follows closely the voltage to be monitored under both steady state and rapidly changing conditions thereof and a fast response circuit connected across said second output to respond to rapid changes in the voltage to be monitored.

3,870,927
CAPACITOR VOLTAGE TRANSFORMER SYSTEM

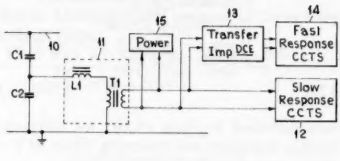
Michael Alan Hughes, Gnosall, England, assignor to The English Electric Company Limited, London, England

Continuation-in-part of Ser. No. 260,247, June 6, 1972, abandoned. This application Oct. 4, 1973, Ser. No. 403,489

Claims priority, application Great Britain, June 8, 1971, 19420/71

Int. Cl. H02h *7/16*

U.S. Cl. 317—12 B **4 Claims**



1. A capacitor voltage transformer system comprising:

a. a capacitor voltage transformer consisting of:

1. a chain of capacitors across which an input voltage is applied; and
2. an electromagnetic transformer having an input connected across the capacitor of said chain and an output at which the output of the capacitor voltage transformer appears;

and

b. an impedance network having an input connected to the output of said electromagnetic transformer and an output from which an output of the system is derived;

c. the impedance network having been its input and output a transfer function which is substantially the inverse of the transfer function between the input and the output of the capacitor voltage transformer under operating conditions.

3,870,928
VOLTAGE MONITORING SYSTEM

Melvin O. Allen, 1408 4th Ave., Canyon, Tex. 79015

Division of Ser. No. 346,262, March 30, 1972, Pat. No. 3,815,062, which is a continuation of Ser. No. 171,862, Aug. 16, 1971, abandoned. This application Jan. 31, 1974, Ser. No. 438,199

Int. Cl. H02h *7/09*

U.S. Cl. 317—13 R **13 Claims**

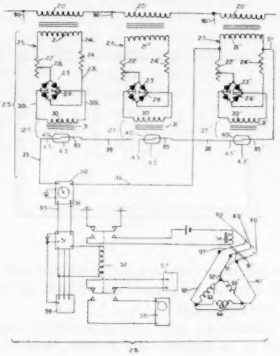
1. Process of monitoring a voltage power source for a motor circuit comprising steps of

a. passing a fixed portion of the monitored voltage to a solenoid coil surrounding a magnetically permeable core and developing within said core a magnetic field less than the saturation value thereof,

b. increasing and decreasing the magnetic field intensity in a direction parallel to the direction from the periphery of said core to the axis thereof responsive to changes in current through said coil,

c. sensing changes in magnetic field of said core at a particular small zone thereof by moving magnetically sensitive

free arm ends located across a small gap space responsive to such changes while maintaining the position of the center of said gap between such arms and in said zone unchanged in position and spaced away from the axis of the core and spaced away from the ends of said core during operation of said arms,



d. opening and closing an electrical circuit through the free ends of said arms in response to changes in current through said coil,

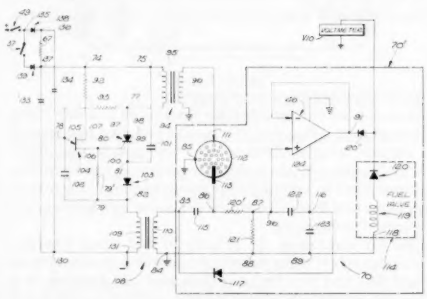
e. disconnecting power from said motor circuit in response to a changing voltage of said monitored circuit more than a predetermined amount and reconnecting power to said motor circuit in response to a voltage changed less than the predetermined amount.

3,870,929

IGNITION SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,889
Int. Cl. F23q *3/00*
U.S. Cl. 317—96 **4 Claims**



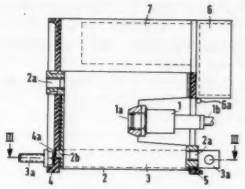
1. A spark ignitor for a combustible fuel, said ignitor comprising: a first junction; a first switch for connection to a conductor having a positive potential to said first junction; first and second inductive means each having first and second leads; a charging resistor connected from said first junction to said first inductive means first lead: a second switch for closure after said first switch is connected in parallel with said charging resistor; a silicon-controlled rectifier (SCR) having an anode, a cathode and a gate, said anode being connected from said first inductive means second lead; a diode having an anode connected from said SCR cathode, and a cathode connected to said second inductive means first lead, said second inductive means second lead being adapted for connection to a conductor of a negative potential; a main capacitor connected from said first inductive means first lead to said diode anode; said diode cathode being connected to said SCR gate; a second junction connected from said first inductive means first lead; starting means and hold off connected from said second junction to said SCR gate to fire said SCR when said second switch is closed; and conductor means connected with said first inductive means to establish an arc when the energy stored in said main capacitor is transferred to said first inductive means.

3,870,930

IMPROVED SEMICONDUCTOR RECTIFIER ASSEMBLY HAVING A PIVOTABLE CONTROL MODULE

Herbert Nitsche, Spardorf, and Johann Hufnagl, Erlangen, both of DT, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 18, 1973, Ser. No. 407,454
Claims priority, application Germany, Oct. 30, 1972, 39821
Int. Cl. H01l *1/06, 1/12*
U.S. Cl. 317—100 **8 Claims**



1. In a semiconductor rectifier assembly, wherein a semiconductor rectifier is mounted in a heat sink which is arranged between front and rear insulating plates, there being installed along with the rectifier and heat sink protective circuitry and a control module, and wherein the anode and cathode terminals of the rectifier are led to the front of the assembly through cut-outs in the front insulating plate, an improved arrangement which permits greater compactness of installation and eases wiring comprising:

a. means coupling the anode of the rectifier to the heat sink;

b. a cut-out in the rear insulating plate;

c. a terminal electrically connected to said heat sink protruding through said cut-out in said rear insulating plate; and

d. a hinge mounting the control module on the front insulating plate so that said control module can be swung away from said plate.

3,870,931

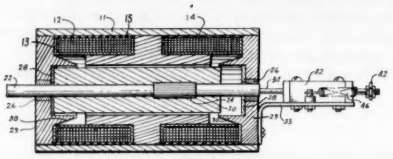
SOLENOID SERVOMECHANISM

John L. Myers, Dayton, Ohio, assignor to Sun Chemical Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,324
Int. Cl. G05b *11/28*
U.S. Cl. 317—146 **7 Claims**

1. In a solenoid control mechanism, a movably supported armature, bias means urging said armature in a first direction, electromagnetic means energizable to move said armature in opposition to said bias means, said electromagnetic means producing a magnetic field attracting said armature into a region in which the attractive force of said magnetic field does not increase, position sensor means to sense the position of said armature or a condition controlled by said armature and provide a first signal representing present armature position, command means providing a second signal directing an armature position or a condition controlled thereby, comparison means comparing said first and second signals and providing

an error signal having a magnitude representing a difference between said first and secon signals, a driver circuit coupled to drive said electromagnetic means, control means coupled to said driver circuit and receiving said error signal, said con-



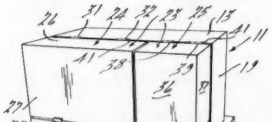
trol means generating a pulse modulated signal applied to said driver circuit, said control means including means controlling the pulse width of said pulse modulated signal in relation to the magnitude of said error signal thus to control the duty cycle of said driver circuit.

3,870,932

TRANSFORMER TERMINAL COMPARTMENT COVER MEANS

Alvin Y. Broverman, Versailles, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Filed Oct. 15, 1973, Ser. No. 406,186
Int. Cl. H01f *27/00*
U.S. Cl. 317—157.6 **6 Claims**



1. In combination with a transformer tank having high voltage and low voltage terminals extending from separate portions of a side wall, cover means comprising a high voltage and a low voltage cover alongside each other, each cover having a top, a front and an outside wall, the high voltage cover additionally having a barrier integral therewith between the high voltage and low voltage segments, said low voltage cover additionally having a portion overlapping said high voltage cover when said covers are in a closed position, the top of each cover being independently hinged to the tank top, each cover having means for independently locking the cover when in a closed position, whereby swinging open of the low voltage cover will permit access to the low voltage terminals from the front and one side of the transformer but will not permit access to the high voltage terminals.

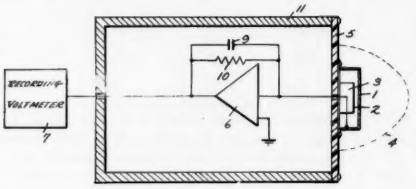
3,870,933

SYSTEM FOR CONTROLLING AN ELECTRIC FIELD

Kenneth C. Huber, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 123,229, March 11, 1971, abandoned. This application July 31, 1973, Ser. No. 384,229
Int. Cl. G01r *5/28;* **H05**
U.S. Cl. 317—262 AE **5 Claims**

1. A system for controlling an electric field comprising:
an ungrounded metallic electrode exposed to the atmosphere,
a radioactive source associated with said metallic electrode for creating outside said electrode an ion cloud unconstrained in the atmosphere surrounding said metallic electrode to place said electrode in contact with said atmosphere,
a current indicator means electrically connected to said electrode,
an insulator mounted between said electrode and said indicator means and extending past the boundary of said ion cloud,



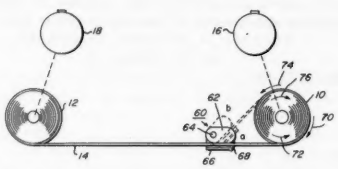
an amplifier disposed between said insulator and said indicator and electrically connected directly to said probe and said indicator, and
means for introducing into said atmosphere ions of such polarity as to neutralize said electric field and control means connected to said indicator means for energizing said neutralizing means when said indicator means produces an output as a function of said output.

3,870,934

WEB TENSION CONTROLLER

Charles H. Blood, 149 Gregory Hill Rd., Rochester, N.Y. 14620

Filed Dec. 14, 1973, Ser. No. 425,053
Int. Cl. H02p *5/46;* **B65h** *77/00*
U.S. Cl. 318—7 **14 Claims**



1. In an apparatus for controlling the tension in a web being transported from a first reel to a second reel, first and second drive motors being coupled to said first and second reels, respectively, and wherein a signal is generated to control the torque produced by said first drive motor to control the torque produced by said first drive motor to control web tension, the improvement comprising:
means for controlling the polarity of said signal whereby said signal is of a first polarity if said web is unwound from said first reel in a first direction and said signal is of a second polarity if said web is unwound from said first reel in a second direction.

3,870,935

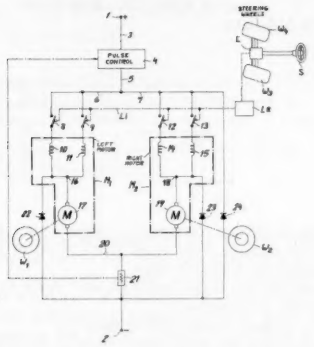
VEHICLE DRIVE WITH TWO ELECTRIC MOTORS

Theodor Abels, Breunsberg, and Siegfried Puschel, Aschaffenburg, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 13, 1973, Ser. No. 332,226
Int. Cl. H02p *5/46*
U.S. Cl. 318—52 **10 Claims**

1. In an electrically operated vehicle having a pair of driving wheels on opposite sides of the vehicle, a source of electric

current, and respective motors operatively connected to said wheels, the improvement which comprises a control circuit connected between said source and said motors and including driving-pulse generating means in circuit with said source, respective switches connecting said generating means to said motors in parallel and operable to cut off one of said motors selectively to enable differential rotation of said wheels, each of said motors being a series-wound direct current motor having a field winding and an armature connected in series with one another, each of said switches being connected in series with the field winding and armature of a respective motor at one side thereof, the series network of field winding, switch and armature of both motors being connected together



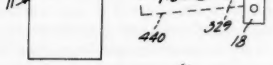
on one side thereof via a common conductor, a sensor provided in circuit with said common conductor and connected in a feedback path to said pulse generating means each of said field windings including a pair of field coils respectively excitable for driving the respective motor in opposite senses, each switch associated with the respective motor including a switch member in series with a coil of the respective pair, a free running diode connected between said common conductor and said pulse generating means across at least one of said motors, and at least one armature diode connected between said common conductor and across at least one of said armatures between said one of said armatures and the respective field winding.

3,870,936

DIGITAL MOTOR CONTROL SYSTEM FOR WEB REGISTRATION

Daniel A. Coberley, Danville, Ill., assignor to Hurletron Incorporated, Danville, Ill.

Filed May 25, 1972, Ser. No. 256,769
Int. Cl. H02p *5/46*
U.S. Cl. 318—85 **1 Claim**



1. A web control system for maintaining a register condition between successive repeat lengths of a moving web and a cyclically operating work applying means which acts on the web at a work location along the path of movement of the web, so as to tend to cause the work applying means to act on the web at a predetermined work-receiving region of each succesive repeat length of the web,

said web control system comprising an encoder for generating encoder pulses as a function of successive increments of web movement,

an error counter connected with said encoder and operable for counting encoder pulses.

a counter control circuit connectd with said error counter for controlling the counting of encoder pulses thereby, and responsive to a timing error in the arrival of a work-receiving region of the web at the work location in a cycle of operation of the work applying means to cause the error counter to count encoder pulses for the duration of the timing error, thereby to generate an error count in said error counter for such cycle of operation.

a digital to analog converter connected to the error counter and operable for generating a analog error signal in accordance with the error count in said error counter,

a blanking circuit operable for generating a blanking signal during the time that the error counter is counting encoder pulses in each cycle of operation,

an error correcting motor having an armature circuit producing a back voltage as a function of the speed thereof, a regenerative control circuit for the motor including bidirectional thyristor means for responding to the back voltage of the armature and having an alternating current supply for applying energy to the motor armature circuit under the control of said thyristor means,

drive circuit means connected to said digital to analog converter for receiving the analog error signal therefrom and operable to control the turn-on angle of the thyristor means in accordance therewith so as to tend to reduce the timing error and thus to restore the register condition,

said drive circuit means connected with said blanking circuit and being responsive to said blanking signal to prevent operation of said error correcting motor for the duration of said blanking signal, and to enable the drive means at the termination of said blanking signal in each cyle of operation, and

coupling means for coupling to the thyristor alternating current supply for activating said drive circuit means in each cycle at a predetermined point of the supply waveform such that the motor will be operated by said drive circuit means in proportion to the analog error signal while avoiding any error in firing of the thyristor means as the drive circuit means is activated in each cycle of operatin under the control of said blanking circuit, the thyrister means responding to excessive back voltage of the motor to reverse energize said motor.

3,870,937

SYSTEM FOR DRIVING A DIRECT-CURRENT MOTOR IN SYNCHRONISM WITH AN EXTERNAL SIGNAL

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,579
Claims priority, application Japan, Aug. 14, 1972, 47-80788
Int. Cl. H02p *5/00*
U.S. Cl. 318—314 **10 Claims**

1. A system for driving a direct-current motor in synchronism with an external synchronizing signal in the form of a train of pulses, said system comprising:

a DC power supply for feeding said motor;

means for producing said synchronizing signal;

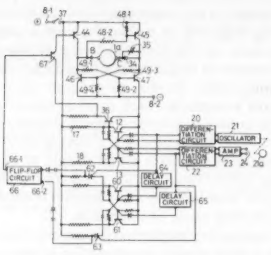
means for producing a rotor position signal in phased relationship to the rotation of said motor, said rotor position signal being also in the form of a train of pulses;

a first control circuit for initiating the flow of current from said DC power supply through said motor in a forward direction thereof to cause the latter to produce driving torque when supplied with each pulse of said synchronizing signal, and for initiating the flow of current from said

DC power supply through said motor in a reverse direction to cause the latter to produce retarding torque when supplied with each pulse of said rotor position signal; and

a second control circuit for controlling the operation of said first control circuit, said second control circuit including:

a first sensing circuit sensitive to at least two consecutive pulses of said synchronizing signal interposed between



the adjacent pulses of said rotor position signal to render said first control circuit inoperative thereby preventing said motor to produce the retarding torque; and

a second sensing circuit sensitive to at least two consecutive pulses of said rotor position signal interposed between the adjacent pulses of said synchronizing signal to permit said first control circuit to return to its normal operative condition.

3,870,938

WAVEFORM GENERATOR AND PHASE SHIFTER

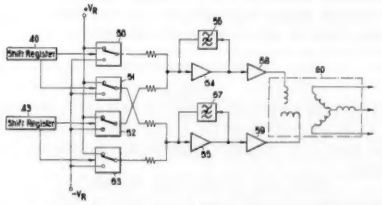
Michael John Tooze, Maidstone, and Peter Michael Knight, Chatham, both of England, assignors to Elliott Brothers (London) Limited, London, England

Filed Apr. 17, 1972, Ser. No. 244,466

Claims priority, application Great Britain, Apr. 20, 1971, 10200/71

Int. Cl. G05b *19/30*

U.S. Cl. 318—605 **8 Claims**



1. A waveform generator which, in response to an input A.C. reference signal having a predetermined frequency and phase angle and an input signal representing a variable angle, develops a sinusoidal output signal which is phase locked to the input reference signal and whose amplitude is a sinusoidal function of said angle represented by the input signal, comprising:

a digital store for storing a digital representation of a sinusoidal waveform;

means for reading out the contents of said store;

a clock generator for producing a clock signal which is synchronised to the reference signal and which controls said read-out means so as to produce two sinusoidal signals of fixed amplitude at the frequency of the reference signal and having phase angles which are respectively advanced and retarded with respect to the phase angle of the reference signal by said variable angle;

and summing means having a pair of input terminals for receiving said sinusoidal signals for summing said sinusoidal signals, whereby said desired sinusoidal output signal is produced.

3,870,939

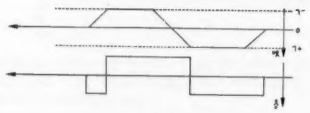
METHOD FOR CONTROLLING ACCELERATION AND DECELERATION OF A TRACTION MOTOR

Michel Robert, Gif sur Yvette, France, assignor to Engins Matra, Yvelines, France

Filed June 22, 1972, Ser. No. 265,161

Int. Cl. G05b *5/01*; **B60l** *15/20*

U.S. Cl. 318—611 **8 Claims**



1. The method of controlling a traction motor, in the operation of a railroad train, rapid tansit train, or like vehicle, comprising the following steps:

A. sensing the actual speed of the vehicle to develop an actual speed signal V_a;

B. developing a speed setting signal V_E;

C. modifying the actual speed signal to advance the phase thereof, thus developing a modified actual speed signal;

D. additively comparing the signals from steps B and C to develop a selector signal ϵ;

E. differentiating the selector signal ϵ within the constraint limits $+a$, 0, $-a$ to develop a derivative of setting acceleration signal γ having values as follows:

$\dot{\gamma} = +a$ if $\Delta \geq \epsilon_1$

$\dot{\gamma} = 0$ if $-\epsilon_1 < \epsilon < +\epsilon_1$

$\dot{\gamma} = -a$ if $\epsilon \leq \epsilon_1$

wherein ϵ_1 is of a predetermined amplitude;

F. integrating the derivative of setting acceleration signal in accordance with $1/p$ and within acceleration constraint limits $+L$ and $-L$ to develop a setting acceleration signal γe;

G. additively comparing the setting acceleration signal γe with an actual acceleration signal to develop an initial control signal γc;

H. and effectively applying the initial control signal to the traction motor to control motor operation.

3,870,940

APPARATUS FOR COMPENSATING TWO AXES GIMBAL ERROR

David A. Espen, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,001

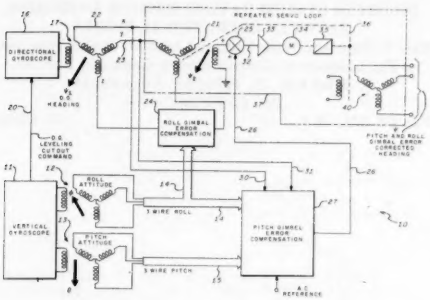
Int. Cl. G05b *11/01*; **G05d** *1/08*; **B64c** *13/18*

U.S. Cl. 318—633 **7 Claims**

1. In a gyroscopic data transmission system including a directional gyroscope having a transmitter connected thereto and a receiver electrically coupled to said transmitter by a multicircuit line and wherein said transmitter and receiver have multiple branches each coupled to a respective branch of said multicircuit line, apparatus for compensating the heading signal of said directional gyroscope for gimbal errors with respect to roll and pitch axes thereby providing a totally compensated heading output signal substantially absent said roll and pitch gimbal errors comprising

means for providing pitch and roll signals representative of the pitch and roll attitudes of said gyroscope respectively,

means coupled in only one branch of said multicircuit line and responsive to only one of said pitch and roll signals for compensating said heading signal only for said gimbal error corresponding to said one signal thereby providing a single axis compensated heading signal at said receiver, the remaining branches of said multicircuit line directly connecting the associated respective branches of said transmitter to the corresponding branches of said receiver,



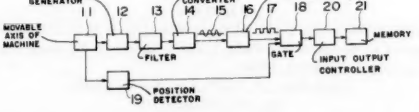
compensation means responsive to said heading signal of said gyroscope and to said pitch and roll signals for providing a compensation signal in accordance with the product of a function of heading, a function of said pitch attitude and a function of said roll attitude, and

means coupled to the output of said receiver and to said compensation means for combining said compensation signal with said single axis compensated heading signal to provide said totally compensated heading output signal.

3,870,941
METHOD AND CIRCUIT FOR SAMPLING POSITION DATA

Junichi Ikenga; Shigeru Matsuoka, both of Toyama, and Yoshio Okabe, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama-ken, Japan

Filed June 25, 1973, Ser. No. 373,116
Claims priority, application Japan, June 30, 1972, 47-65610
Int. Cl. G05b *21/02*
U.S. Cl. 318—636 **18 Claims**



1. A method of sampling position data for use in the continuous path control of an industrial robot, said method comprising:

generating a position data representing the position of a drive axis of said industrial robot,

detecting the speed of movement of said drive axis,

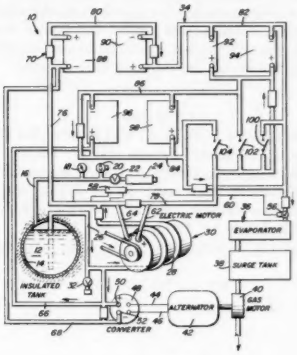
generating a sampling pulse signal comprised of a plurality of sampling pulses having a frequency which is a function of the speed of said drive axis, and

sampling said position data in accordance with said sampling pulses at a rate which is a function of said speed of said drive axis.

3,870,942
NON-POLLUTION MOTOR WITH GAS TUBE CONDUCTORS

Harold L. Boese, 7020 William Dr., and Thomas R. Hencey, Jr., P.O. 3119, both of Galveston, Tex. 77550

Continuation-in-part of Ser. No. 273,684, Aug. 21, 1972, , which is a continuation-in-part of Ser. No. 106,651, Jan. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,814, Dec. 3, 1970, Pat. No. 3,681,609. This application Aug. 27, 1973, Ser. No. 391,544
Int. Cl. F16l *11/12*; **H02j** *7/00*
U.S. Cl. 320—2 **14 Claims**

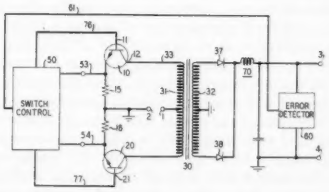


7. In combination with a battery source of electrical energy and an electrodynamic device, a source of cryogenic fluid, a heat exchanger, conduit means including portions respectively interconnecting the source of fluid with the heat exchanger, the battery source and the source and the electrodynamic device, said portion connecting the battery source to the electrodynamic device; conducting electrical current to the electrodynamic device through the conduit means while the cryogenic fluid is absorbing heat from the battery source.

3,870,943
CONVERTER CIRCUIT WITH CORRECTION CIRCUITRY TO MAINTAIN SIGNAL SYMMETRY IN THE SWITCHING DEVICES

Herbert Rudolf Weischedel, Rockaway, and George Raymond Westerman, Denville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 281,436, Aug. 17, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,518
Int. Cl. H02m *1/18*
U.S. Cl. 321—2 **9 Claims**



6. Symmetry correction circuitry to balance the signals in alternately switched first and second switching devices comprising,

first and second sensing means in series with each of said first and second switching devices, respectively, to individually monitor the signals in said switching devices,

differential amplifier means responsive to said first and second sensing means to generate a difference signal proportional to the difference in signals conducted by the first and second switching devices,

means to generate a first periodic signal,

means to integrate said difference signals and said first periodic signal and means to derive therefrom a second periodic signal wherein the average signal level of said second periodic signal is responsive to said difference signal, and

comparator means coupled to receive said second periodic signal and having an upper and lower threshold, said comparator means responding to said second periodic signal by generating a drive signal when the second periodic signal exceeds said upper and lower thresholds, whereby the drive signal is utilized to control the switching of said first and second switching devices.

3,870,944

SEMICONDUCTOR RECTIFIER APPARATUS

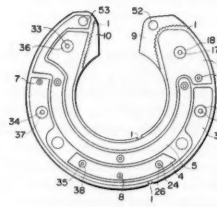
Kazuo Ogawa, Yokohama; Tetsuo Machii, Tokyo; Takahiro Sawano, Kawasaki; Katuhiko Kubota, Yokohama, and Yoshiharu Yotumoto, Kawasaki, all of Japan, assignors to Tokyo-Shibaura Eelctric Co., Ltd., Kawaski-shi, Japan

Filed July 18, 1973, Ser. No. 380,401

Claims priority, application Japan, July 21, 1972, 47-85344[U]

Int. Cl. H02m *7/20*

U.S. Cl. 321—8 R **2 Claims**



1. Semiconductor rectifier apparatus comprising an insulator plate; first, second and third conductive films which are formed on one surface of said insulator plate and are adapted to be connected to receive respective phase currents of a three phase alternator; first and second DC output conductive plates applied onto the other surface of said insulator plate; three pairs of main semiconductor rectifier elements mounted on said insulator plate and connected between said first, second and third conductive films and said first and second conductive plates so as to form a three phase full-wave rectifier, each one of said first and second conductive plates being formed with three circular recesses adapted to contain said three pairs of the main semiconductor rectifier elements, each rectifier element comprising one electrode carried by a metal support soldered to the bottom surface of said circular recess, a resilient lead wire connected to the other electrode extending to the outside through said insulator plate and a predetermined one of said conductive films, a reinforcing ring encircling the projected end of said lead wire, and solder means for securing said reinforcing ring to said predetermined one of said conductive films together with said projected end; a fourth conductive film formed on said one surface of said insulator plate; three solts formed in the predetermined positions of said first and second DC output conductive plates; three auxiliary semiconductor rectifier elements each having first and second lead wires, said semiconductor rectifier elements being inserted in said three solts and mounted on the other surface of said insulator plate, one ends of said lead wires being inserted through said insulator plate and connected between said fourth conductive film and said first, second and third conductive films so as to form a three phase auxiliary full-wave rectifier; the positive and negative main DC output terminals of said full-wave rectifier which are provided for said first and second conductive plates, respectively; and an auxiliary DC ouput terminal of said auxiliary full-wave rectifier which is provided for said fourth conductive film.

3,870,945

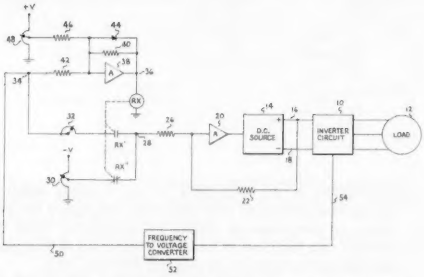
INVERTER SYSTEM HAVING SMOOTH SWITCHING BETWEEN OPERATIONAL MODES

Niels P. Pedersen, Waterford, and John M. Shabel, Erie, both of Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 28, 1974, Ser. No. 446,645

Int. Cl. H02m *1/08*

U.S. Cl. 321—9 A **16 Claims**



1. In an inverter system including an inverter circuit for converting direct current power from a source to alternating current power of the type operable in both the pulse width modulation and square wave modes, means to maintain a substantially constant voltage-frequency relationship of the system output comprising:

a. means for maintaining the voltage of the direct current power source substantially constant during operation of said inverter circuit in the pulse width modulation mode;

b. means for varying the voltage of the direct current power source proportionally to the desired output frequency of the inverter circuit during operation in the square wave mode;

c. means to determine when a change in operational mode of said inverter circuit is to be made; and,

d. means operative at the time of making a change between the two modes of operation of the inverter circuit to effect a substantially instantaneous incremental change in the value of the direct current source voltage.

3,870,946

QUICK CONNECT MODULAR VOLTAGE MULTIPLIER

Robert E. Sandorf, Richfield, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 13, 1973, Ser. No. 424,546

Int. Cl. H02m *7/10*

U.S. Cl. 321—15 **12 Claims**

1. A quick connect/disconnect modular voltage multiplier assembly comprising, in combination:

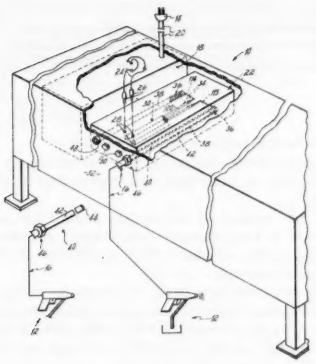
an elongated voltage multiplier with low voltage input terminals disposed at one end thereof and a high voltage output terminal disposed at the opposite end thereof;

at least one elongated female socket with an open end for receiving an elongated plug with a conductive tip, said socket being disposed in substantially parallel relation to said elongated voltage multiplier with said open end being disposed adjacent said input terminals, said socket including a closed end disposed adjacent said high voltage output terminal;

an electrical connection means disposed at said closed end of one said socket for electrically connecting the tip of an

elongated plug when inserted into said socket, with said high voltage output terminal, said electrical connection being physically shaped to minimize corona discharge;

an encapsulation having at least first and second differently disposed external faces for completely surrounding and supporting said voltage multiplier, said socket and said electrical connection means, said encapsulation being



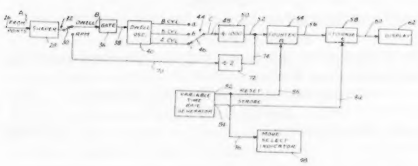
shaped so that said open end of each said socket and said input terminals are accessible through said first and second faces, respectively, of said encapsulation so that external plugs can quickly connect or disconnect relative thereto, by movement thereof in different directions corresponding to the directions of said differently disposed first and second external faces.

3,870,947

METHOD AND APPARATUS FOR MEASURING THE DWELL AND RPM OF AN ENGINE

Leslie L. Fields, Rt. 1, Anna, Ill. 62906

Filed Nov. 12, 1973, Ser. No. 414,951
Int. Cl. G01r *29/00*
U.S. Cl. 324—16 R **23 Claims**



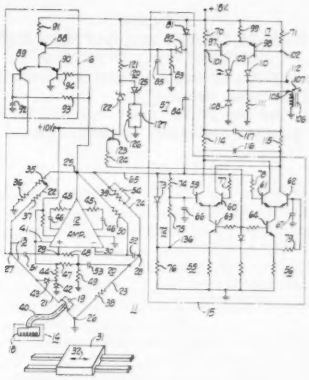
1. Apparatus for measuring the dwell of an internal combustion engine having distributor points which oscillate between open and closed positions during engine operation, the apparatus comprising means for generating a first oscillating signal whenever the distributor points are in one condition, the frequency of the first signal being substantially greater than and independent of the point frequency, means for generating second signals representing a count, the count being related to the number of first signal oscillations generated during a selected time interval, and means for generating a display indicative of said count.

3,870,948

PROXIMITY CIRCUIT WITH ACTIVE DEVICE FEEDBACK

Frederick R. Holt, Cleveland, and Noah Flueckiger, Solon, both of Ohio, assignors to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Sept. 5, 1972, Ser. No. 286,277
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS **19 Claims**



1. A proximity switch circuit comprising in combination,

a main amplifier having an output and an input,

a proximity probe,

feedback means connecting said amplifier output to said amplifier input,

means connecting said probe as part of said feedback means to produce a signal at said input of said amplifier which is variable in accordance with the distance from said probe to a conductive target,

an auxiliary alternating current amplifier,

means connecting said auxiliary amplifier as part of said feedback means to vary said main amplifier alternating current input,

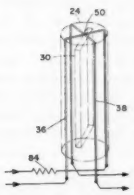
and detector means connected to detect reduced output of said main amplifier and connected to control said auxiliary amplifier to increase the alternating current output of said main amplifier.

3,870,949

METHOD AND APPARATUS FOR TESTING THE PULSE PERMEABILITY OF LAMINAE OF CORE LAMINATIONS

Leonard A. Mayberry, 710 Paul St., Escondido, Calif. 92027

Filed Apr. 19, 1974, Ser. No. 462,337
Int. Cl. G01v *33/12*
U.S. Cl. 324—34 PE **14 Claims**



1. Apparatus for testing the pulse permeability of core laminae comprising,

a transformer having a first winding in a first plane and a second winding in a second plane with said planes and winding loops having a 90° orientation to one another,

means for positioning a portion of core laminae in the loops of both of said windings,

means for providing a plurality of electrical pulses to said primary winding,

and means responsive to output pulses in said secondary winding in response to said pulses provided to said primary winding for determining the pulse permeability of said core laminae.

3,870,950
OVERVOLTAGE PROTECTED, BATTERY POWERED ELECTRIC CIRCUIT TESTER

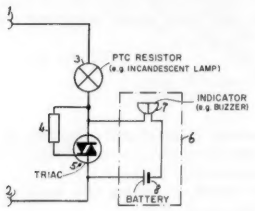
Heinz Laass, Hahn, Germany, assignor to Taco-Tafel GmbH Co., KG, Esslingen, Germany

Filed Dec. 17, 1973, Ser. No. 425,190

Claims priority, application Germany, Jan. 13, 1973, 2301742

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **7 Claims**



1. External Voltage protected electrical continuity tester to test the continuity of normally deenergized, connected electrical lines but which may have voltages applied thereto,

said tester having a pair of input terminals (**1, 2**);

a protective circuit comprising a positive temperature coefficient (PTC) resistor (**3**) and a voltage-controllable semiconductor switch (**5**) connected in series to the PTC resistor (**3**) the free terminal of the PTC resistor, and of the switch (**5**) being connected to the respective tester input terminals (**1, 2**);

and a continuity checking circuit comprising a voltage source (**8**) and a current flow indicator (**7**) connected in series to the voltage source (**8**), the free terminal of the voltage source, and of the indicator being connected, respectively, across the semiconductor switch (**5**), the voltage source (**8**) having an output voltage which is below the breakdown voltage of the semiconductor switch to permit connection of the terminals (**1, 2**) to deenergized connected lines to be tested for continuity and provide a signal from the current indicator (**7**) due to current flow through the connected lines and the cold-resistance of the PTC resistor upon detection of continuity while, if the lines should be energized by a voltage normally destructive to the current indicator, the voltage-controlled semiconductor switch (**5**) will become conductive and permit current to flow through the PTC resistor which will self-limit the current upon heating thereof due to said current flow, the voltage drop across the semiconductor switch during conduction of the switch being less than the voltage which would damage at least one of: said voltage source (**8**); said current indicator (**7**).

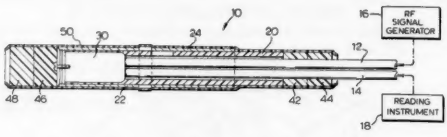
3,870,951
MOISTURE MEASURING PROBE

Earle C. Brown, Oakville, Ontario; Errol J. Byers, and Ghulam A. Kayani, both of Mississauga, Ontario, all of Canada, assignors to Ontario Research Foundation, Sheridan Park, Ontario, Canada

Filed Mar. 6, 1974, Ser. No. 448,562

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 P **7 Claims**



1. A moisture measuring probe comprising:

an elongate hollow cylindrical element having an exterior surface and an axial bore and constructed of dielectric material,

a pair of cylindrical electrically-conductive elements mounted in longitudinally spaced-apart relation on the exterior surface of said hollow cylindrical element and supported thereby,

said pair of cylindrical conductive elements being capable fo establishing a voltage therebetween only through materials of the environment in which the probe is located,

high frequency detector circuit means positioned within the axial bore of said elongate hollow cylindrical element,

electrical connection means separately connecting elements of said detector circuit means to said pair of cylindrical elements for detecting voltage generated between said cylindrical elements when said probe is located in a moisture-containing environment and providing a direct current signal corresponding to said detected voltage,

first electrical cable means connected to said detector circuit means and extending remote from said probe to convey alternating current high frequency signals to said detector circuit means whereby said generated voltage may be provided,

second electrical cable means connected to said detector circuit means and extending remote from said probe to convey said direct current signal from said probe,

sealing means isolating said axial bore from fluid flow communication with the exterior environment of the probe,

and an outer covering of dielectric material overlying and encapsulating said pair of electrically-conductive elements and said elongate cylindrical element.

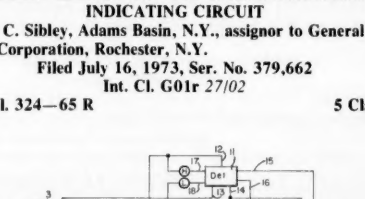
3,870,952
BALLAST RESISTANCE AND TRACK CONTINUITY INDICATING CIRCUIT

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed July 16, 1973, Ser. No. 379,662

Int. Cl. G01r *27/02*

U.S. Cl. 324—65 R **5 Claims**



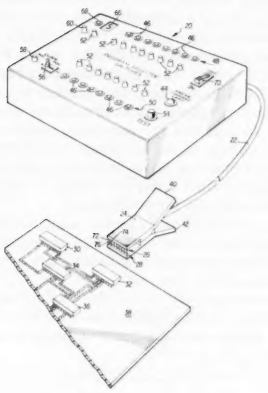
1. A measuring device for measurement of ballast resistance in a section of track comprising.

an oscillator producing a high frequency signal,
coupling means connected to said oscillator,
a variable resistor connecting said coupling means to said track, and
detector means connected to said track and to said variable resistor including further means to indicate, as the variable resistor is varied in value, when the voltage across said resistor is equal to the voltage across said track.

3,870,953
IN CIRCUIT ELECTRONIC COMPONENT TESTER

Roger M. Boatman, Titusville, and Melvin R. Hall, Castleberry, both of Fla., assignors to Roger Boatman & Associates, Inc., Titusville, Fla.

Filed Aug. 1, 1972, Ser. No. 277,085
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 R **38 Claims**

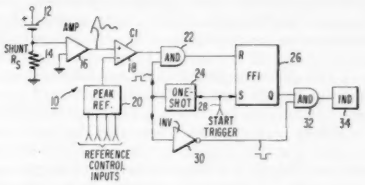


1. Electrical circuit test apparatus for use with a support base having electrical conductors and a plurality of housings mounted on said support base, each of said housings having a plurality of electrical terminals which serve as electrodes for active circuits contained in said housings with the electrical terminals on one housing being directly connected to electrical terminals on the other housings for transmitting electrical signals therebetween; said apparatus being characterized by having a connector member comprising a plurality of electrical terminals adapted to simultaneously engage the electrical terminals on one of said housings while said housing is on said support base with its terminals connected to said electrical conductors, said member being adapted to be selectively placed on different ones of said housings one at a time in seriatim to thereby test the circuits in the housings individually; and circuit means connected to the individual terminals of said connector member for supplying a signal voltage having an amplitude sufficient to test proper operation of an active circuit during a period of less than about 10μ seconds to be sufficiently short to prevent damage to electrical components not being tested by said signal voltage that are in housings connected to said support base and for producing an indication of the operation of the tested circuit, said indication lasting beyond the end of the test period.

3,870,954
STARTER SYSTEM FAULT DETECTOR

Richard Eric Hanson, Woburn, and Howard Eisen Fineman, Newton Centre, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,800
Int. Cl. G01r *31/00*
U.S. Cl. 324—158 MG **10 Claims**

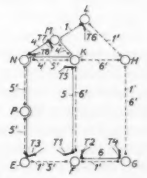


1. A starter system fault detector for use with an engine having a starter motor and an electrical starter system which supplies starter current to said starter motor during a starting sequence, said fault detector comprising, in combination:
means for detecting the initial starter current waveform peak to provide a first signal indicative thereof;
means for providing a reference signal indicative of a given starter current waveform peak;
means for comparing said first signal to said reference signal to provide an output signal indicative of the relative magnitude difference between said initial waveform peak and said given waveform peak;
means for providing a predetermined time period related to the time period of said initial waveform peak;
means responsive to said output signal for providing a fault signal if the polarity of said relative magnitude difference indicates that the initial starter waveform peak is greater than the reference signal, and the polarity of the relative magnitude difference fails to reverse and indicate a waveform value less than the reference signal during said predetermined time period; and
means responsive to said fault signal for providing a fault indication.

3,870,955
EMERGENCY SWITCHING EQUIPMENT FOR BROADBAND TRANSMISSION

Gunther Ouvrier, Tumba, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 21, 1973, Ser. No. 361,986
Claims priority, application Sweden, June 9, 1972, 7606/72
Int. Cl. H04j *3/14*
U.S. Cl. 325—2 **15 Claims**



1. In a telecommunication system having a central control unit and a telecommunication network wherein there are a plurality of stations interconnected by bidirectional primary links used during normal fault-free operation and spare sections used when there is a fault in at least one of the primary links and wherein the central control unit initiates the changeover to selected spare sections upon detection of a fault,

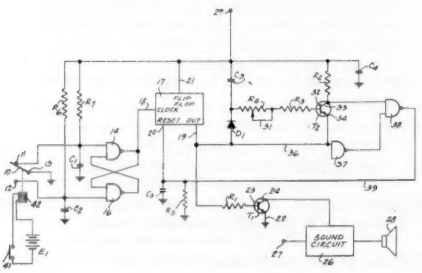
switchover apparatus controlled by the central unit in at least one of the stations wherein at least one of the primary links terminates and the station has the terminal equipment associated with such primary link and at least two spare sections connected from said one station to other stations, said switchover apparatus comprising: a first switching unit having first and second internal terminals (UT1, IN1), incoming signals switching means (M) for connecting either the primary link (5) to the terminal equipment of said first internal terminal to the terminal equipment, and outgoing signals switching means (S) for connecting the primary link to the terminal equipment or to said second internal terminal; a second switching unit having a third internal terminal (IN3) and an output switching means (U) for connecting either said second internal terminal or said third internal terminal to the spare section (5'); a third switching unit having a fourth internal terminal (UT3) and an input switching means (J) for connecting the spare section (5') to either said third internal terminal or said first internal terminal; and a fourth switching unit having a through connection means (H) for connecting either said fourth internal terminal (UT3) or the other spare section (1') to said internal terminal.

3,870,956

SOUND MUTING CIRCUIT WITH AUTOMATIC SOUND RETURN

Robert A. Wolff, Lombard, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Sept. 17, 1973, Ser. No. 397,942
Int. Cl. H04b *1/10*
U.S. Cl. 325—478 **10 Claims**



1. An automatic sound muting circuit for disconnecting sound to a speaker for a predetermined time comprising;

a bi-stable trigger circuit having an input terminal,

a reset terminal and an output terminal,

a sound circuit connected to said output terminal, and

said speaker connected to said sound circuit when said trigger circuit is in a first state and said speaker disconnected to said sound circuit when said trigger circuit is in a second state,

a first pulse circuit connected to the input terminal of said trigger circuit,

a timing circuit connected to the output terminal of said trigger circuit, and

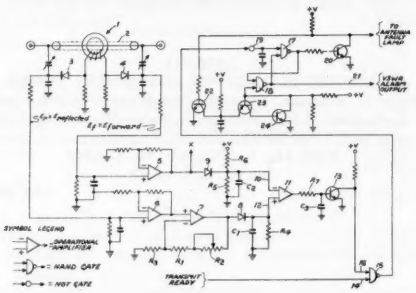
a second pulse circuit connected to said timing circuit and having an output terminal connected to the reset terminal of said trigger circuit.

3,870,957

VSWR ALARM SYSTEM

Richard D. Straw, San Francisco, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 15, 1973, Ser. No. 406,711
Int. Cl. H04b *1/04*
U.S. Cl. 325—150 **13 Claims**



1. A voltage standing wave ratio alarm system comprising:

first means to detect a forward voltage and a reflected voltage on a transmission line;

second means coupled to said first means to amplify said reflected voltage by a given value dependent upon the desired voltage standing wave ratio;

third means coupled to said first means and said second means to compare the amplitude of said amplified reflected voltage to the amplitude of said forward voltage and to produce an alarm indication when the amplitude of said amplified reflected voltage is greater than the amplitude of said forward voltage;

a source of transmit ready signal, said transmit ready signal being present at the output of said source only when a transmitter associated with said system is transmitting on said transmission line; and

fourth means coupled to said third means and said source responding to the simultaneous presence of said transmit ready signal and said alarm indication to produce an alarm.

3,870,958

CIRCUIT FOR APPLYING DATA SIGNALS ACROSS A MICROPHONE INPUT CIRCUIT

Chandos Arthur Rypinski, Tiburon, and Jaime Ernesto Pera, Mill Valley, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1973, Ser. No. 423,688
Int. Cl. H04b *1/02*
U.S. Cl. 325—155 **4 Claims**

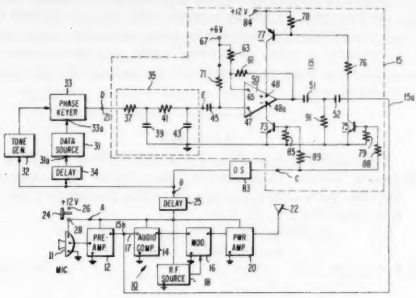
1. In a radio transmitter including a microphone connected by a transmission line to the modulation portion of the transmitter, an improved circuit for coupling audio tone data signals from a source across said transmission line in a manner to avoid D.C. transients associated with the coupling and decoupling of the data signals across the input end of said modulating portion of said transmitter comprising:

an audio amplifier and an A.C. coupling capacitor connected in series between said source and said input end of said modulating portion of said transmitter,

a resistive load coupled across the output of said amplifier for presenting a high impedance to voice signals from said microphone,

said amplifier including a negative feedback circuit and D.C. power coupling terminals for activating said amplifier, said amplifier characterized by a low output impedance when activated and a D.C. voltage at the output that remains close to that at the input such that the output voltage across said capacitor does not change materially

with activation and deactivation of said amplifier to couple and decouple said data signal whereby said D.C. transient voltages are minimized,



means coupled to said power coupling terminals for applying power to activate said amplifier and apply said data signals to said transmitter.

3,870,959

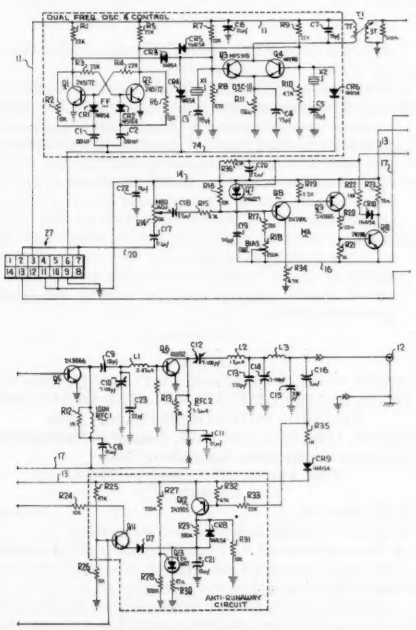
DUAL FREQUENCY TRANSMITTER SYSTEM

Thomas S. Wootton, Mabelvale, Ark., assignor to Baldwin Electronics, Inc., Little Rock, Ark.

Filed Oct. 24, 1972, Ser. No. 300,132

Int. Cl. H04b *1/02*

U.S. Cl. 325—156 **9 Claims**



1. A radio transmitter including two diversely tuned oscillators, a source of sequential on-off control signals, a single lead connecting said source of on-off control signals to both said oscillators concurrently, the on signals conditioning both said oscillators for concurrent oscillation and the off signals inhibiting said oscillation of both said oscillators, bistable flip-flop, means responsive to the alternate states of said bistable flip-flop for alternately inhibiting said oscillations of said oscillators in sequence, means connecting said single lead to said flip-flop for applying said on-off signals to said flip-flop, said flip-flop being responsive to said on-off control signals for alternating the states of said flip-flop.

3,870,960

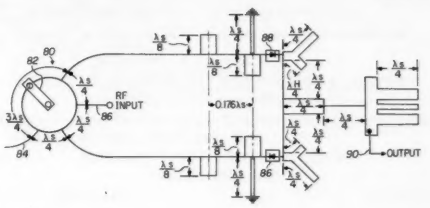
MIXER CARRIER NULL ADJUSTMENT

Ben R. Hallford, Wylie, and Charles H. Wright, Plano, both of Tex., assignors to Rockwell International Corporation, Dallas, Tex.

Filed Oct. 12, 1973, Ser. No. 406,061

Int. Cl. H04b *1/26*

U.S. Cl. 325—446 **6 Claims**



3. In a microstrip microwave rat-race hybrid circuit ring including leads for use in mixing two input signals and outputting resultant signals an improvement comprising, in combination:

field distortion means juxtaposed said ring and adjustable in nearness to said ring and adjustable in position on the circumference of said ring for adjusting the phase and amplitude of reflected signals to minimize the amplitude of reflected signals to minimize the amplitude of one input signal as it appears at an output lead of said circuit ring.

3,870,961

ACTUATING MEANS FOR AFC DEFEAT SWITCH

Kazuo Suzuki, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed June 27, 1973, Ser. No. 373,997

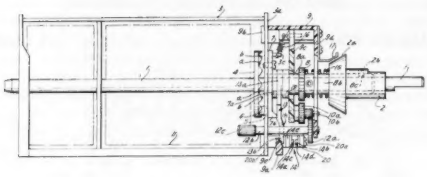
Claims priority, application Japan, July 7, 1972, 47-80524[U]

Int. Cl. H04b *1/06*; **H03j** *5/02*

U.S. Cl. 325—457 **1 Claim**

1. Apparatus for deactuating the AFC circuit in a tuner or the like of the type having a housing, a channel selector shaft movably mounted on said housing, a detent member having recesses and raised portions thereon, said member being mounted on said channel selector shaft for movement therewith, an element adjacent said detent member and movable thereby between a first position and a second position as it rides into said recesses and over said raised portions respectively, a fine tuning shaft movably mounted on said housing, switch means mounted on said housing, said switch means comprising a pair of switch contacts at least one of which is relatively movable with respect to the other between a first position wherein the contacts engage each other and a second position wherein said contacts are disengaged, said switch means being connected to the AFC circuit to deactuate the AFC circuit when said contacts are in said first position, said apparatus comprising first and second resilient members at least one of which is mounted on said housing, said first resilient member being interposed between said element and said second resilient member, a portion of said second resilient member being adjacent one of said contacts so as to move said contacts between said first and said second positions as said element moves between said second position and said first position respectively, means connected to said fine tuning

shaft and slidably mounted on said housing for movement relative thereto as said fine tuning shaft is moved, said slidable means having a cam surface thereon, said second resilient member having a cam follower surface thereon adjacent said cam surface, said slidable means being movable between a



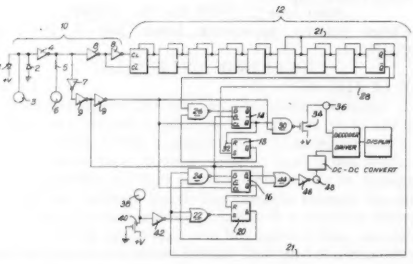
normal position wherein said cam surface does not cause said second resilient member to move said contacts to the first position and a displaced position wherein said cam surface causes said second resilient member to move said contacts to said first position.

3,870,962

MEANS TO CONTROL PULSE WIDTH AND REPETITION RATE OF BINARY COUNTER MEANS

John J. D'Errico, San Diego, Calif., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,388
Int. Cl. H03k *5/04, 1/10*
U.S. Cl. 328—58 **8 Claims**



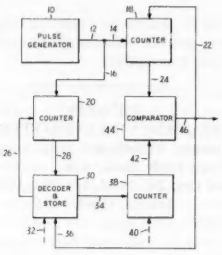
1. A means to control pulse width and repetition rate comprising:
   - a shift register having first and second clock signal inputs and a pulse signal input and two outputs
   - a latch means connected to one of said two (outputs of said shift register such that a signal from said one of said two outputs of said shift register will reset said latch means, said latch means also having means to receive a signal to set said latch means;
   - a first gate means connected to said latch means to receive an output signal of said latch said first gate means comparing said output signal of said latch means with another frequency signal for generating a pulse signal, said first gate means being connected to said shift register to deliver said pulse signal to said pulse signal input of said shift register; and
   - a second gate means having multiple inputs at least one of which receives one of said first and second clock signals and another of which receives said one of said two outputs of said shift register connected to said latch means whereby a pulse of precise width and of a controlled repitition rate is provided at the output of said second gate means.

3,870,963

VARIABLE RATE PULSE GENERATING SYSTEM

Raymond Groce, Mamaroneck, and Ernest A. Kussemaul, Sayville, both of N.Y., assignors to The Loveshaw Corporation, Deer Park, L. I., N.Y.

Filed Mar. 26, 1973, Ser. No. 344,996
Int. Cl. H03k *1/16, 3/72*
U.S. Cl. 328—59 **17 Claims**



1. A system for generating pulses at a rate variable with the passage of time, comprising:
   - a. first circuit means for generating pulses at a constant rate;
   - b. second circuit means connected to said first circuit means for generating an output signal on each generation by said first circuit means of pulses in number equal to a first preselected constant number; and
   - c. third circuit means connected to and responsive to said first and said second circuit means for generating an output pulse on each generation by said first circuit means of pulses in number equal to the algebraic sum of a second preselected number and the number of output signals generated by said second circuit means, the third circuit means output pulses constituting the system-generated pulses.

3,870,964

SOUND VOLUME CONTROL CIRCUIT WITH SOUND LEVEL OUTPUT LINEARLY RELATED TO VOLUME CONTROL POTENTIOMETER SETTING

Thomas B. Mills, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

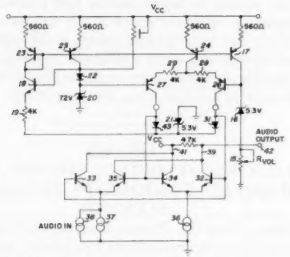
Filed July 16, 1973, Ser. No. 379,747
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **3 Claims**

1. A sound volume control system comprising:
   an attenuator circuit for controlling the level of transmission of an incoming audio signal to an audio signal output, said attenuator circuit comprising:
   - a pair of transistors, the emitter-collector circuits of said transistors being coupled in parallel and being coupled to receive said incoming audio signal, one of said emitter-collector circuits having said audio output coupled thereto,
   - a potentiometer for producing a linear voltage output change responsive to movement thereof,
   - first circuit means responsive to said linear voltage change from said potentiometer for producing a current change

linearly related to said voltage change, said first circuit means comprising:

a differential amplifier including a pair of transistors, and means for applying a reference voltage to the base of one of said latter transistors, said voltage from said potentiometer being applied to the base of the other of said latter transistors,

second circuit means for converting said linear current change to a log function change, said second circuit means comprising:



diodes in each of the emitter-collector circuits of said differential amplifier transistors, said diodes being coupled to the bases of said transistors in said attenuator circuit, and

third circuit means in said attenuator circuit for converting said log function voltage change to a changing audio signal current flow to said audio output linearly related to said potentiometer voltage change.

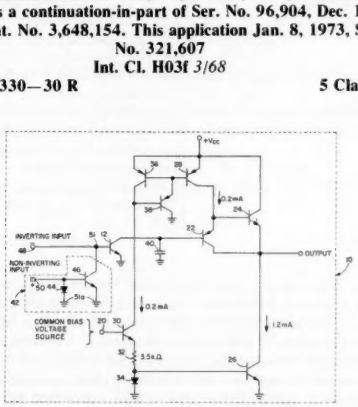
3,870,965
CURRENT MODE OPERATIONAL AMPLIFIER

Thomas M. Frederiksen, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 115,190, Feb. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 96,904, Dec. 10, 1970, Pat. No. 3,648,154. This application Jan. 8, 1973, Ser. No. 321,607

Int. Cl. H03f *3/68*

U.S. Cl. 330—30 R **5 Claims**



1. A circuit for generating a difference current value between a pair of current mode input signals comprising:

a first transistor having emitter, collector and base electrodes and said collector electrode being connected to a first source of potential and said emitter electrode being connected to a second source of potential different from said first source of potential;

first input means for supplying a current equivalent of a first input signal to said base electrode of said first transistor;

a second transistor having emitter, collector and base electrodes and said collector electrode being coupled with said base electrode of said first transistor and said emitter electrode being coupled with said second source of potential;

a diode matched to said second transistor connected between said base electrode and said second source of potential and poled to conduct current in the same direction as the base-emitter junction of said second transistor for developing a predetermined driving voltage for said second transistor; and

second input means for supplying a current equivalent of a second input signal to said base electrode of said second transistor whereby, said second transistor under the influence of said predetermined driving voltage pulls current from said base electrode of said first transistor equal to the value of said second input signal for subtracting said second input signal from said first input signal.

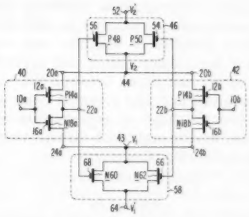
3,870,966
COMPLEMENTARY FIELD EFFECT TRANSISTOR DIFFERENTIAL AMPLIFIER

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 365,836

Int. Cl. H03f *3/68*

U.S. Cl. 330—30 D **17 Claims**



15. The combination recited in claim **14** wherein each amplifier comprises first and second complementary field-effect transistors, each having a conduction path and a gate electrode for controlling the conduction of its path, the conduction paths of said transistors connected in series between said two operating voltage terminals;

the control electrodes of one of said amplifiers connected to one of said input terminals and the control electrodes of the other of said amplifiers connected to the other of said input terminals; and

the connection between the conduction paths of one amplifier connected to one of said output terminals and the corresponding connection of the other amplifier connected to the other output terminal.

3,870,967
METHOD AND APPARATUS FOR ADJUSTMENT OF OFFSET VOLTAGE OF A DIFFERENTIAL AMPLIFIER

Leo L. Wisseman, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 255,764, May 22, 1972, abandoned. This application Aug. 17, 1973, Ser. No. 389,243

Int. Cl. H03f *3/68*

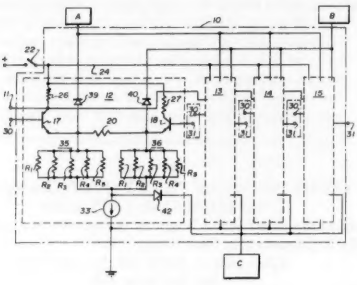
U.S. Cl. 330—30 D **9 Claims**

1. A method for adjusting the input offset voltage of a differential amplifier including first and second transistors, each having at least emitter, base, and collector electrodes and with the emitters thereof interconnected through a resistor and each emitter further connected to a common point through first and second separate pluralities of parallel fusible resistors, respectively, each resistor in each of said first and

second pluralities of resistors having a different fusing voltage, said method including the steps of:

open circuiting the collectors of said first and second transistors; and

applying a voltage of a predetermined magnitude between the base of said first transistor and said common point, the polarity of such voltage selected to forward bias the base-emitter junction of said first transistor to simultaneously apply a voltage across all of the resistors of said



first plurality of resistors connected to the emitter of said first transistor of a magnitude exceeding the fusing voltage of a predetermined number of such fusible resistors of said first plurality of resistors, and simultaneously maintaining the voltage across said second plurality of fusible resistors connected between the emitter of said second transistor and said common point at a value less than the fusing voltage of any resistors of said second plurality to prevent undesired fusing of any resistors of said second plurality of resistors.

3,870,968

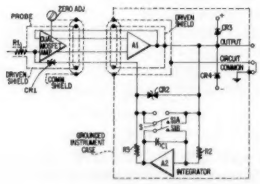
ELECTROMETER VOLTAGE FOLLOWER HAVING MOSFET INPUT STAGE

Robert E. Vosteen, Medina, and Bruce Theodore Williams, Lockport, both of N.Y., assignors to Monroe Electronics, Inc., Middleport, N.Y.

Continuation of Ser. No. 106,749, Jan. 15, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,420

Int. Cl. H03f *21/00*

U.S. Cl. 330—207 P **10 Claims**



1. An ultrahigh impedance wide-band voltage follower for use as an amplifier comprising, a differentially connected operational amplifier circuit to operate as a voltage follower having an input stage comprising a dual channel MOSFET, the first channel having a first gate, source and drain, and the second channel having a second gate, source and drain, the first and second channels being connected as an amplifier with the input to the voltage follower being supplied to the first gate, and the output from the input stage being at the first and second drains, an amplifier connected to the output of the MOSFET input stage, the output of the amplifier constituting the output of the voltage follower, feedback means to apply the output of the voltage follower back to the second gate,

a first protective device having zener conduction and breakdown characteristics,

an integrator, and

switch means operable to a first condition to connect the first protective device between the first gate and the output of the voltage follower to protect the MOSFET input stage when subject to an input overload sufficient to cause destruction of the MOSFET, and to a second condition to interpose the integrator between the output of the voltage follower and the first protective device to integrate a voltage present at the output of the voltage follower due to a residual charge at the input to the voltage follower, and inject a neutralizing current to the input of the voltage follower through the first protective device sufficient to neutralize the residual charge.

3,870,969

DIGITAL LOGIC FREQUENCY CONTROL LOOP FOR MULTIVIBRATOR COMPOSED OF TWO MONOSTABLE ELEMENTS

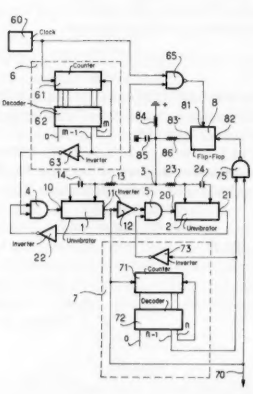
Jean-Rabasse, Breuillet, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 23, 1973, Ser. No. 418,173

Claims priority, application France, Nov. 22, 1972, 72.41470

Int. Cl. H03b *3/04*

U.S. Cl. 331—1 A **8 Claims**

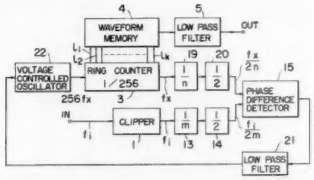


1. A frequency controlled multivibrator comprising a first and a second univibrator of the monostable type, a first logic gate connected between the output of said first univibrator and the input of said second univibrator, a second logic gate connected between the output of said second univibrator and the input of said first univibrator, a clock generating a pilot frequency signal, first digital means connected between the output of said clock and said second logic gate for providing an output pulse for each m clock pulses received, second digital means connected between the output of said first univibrator and said first logic gate for providing an output pulse for each n pulses received from said first univibrator, the time duration of n pulses from said first univibrator being equal to the time duration of m clock pulses, control means responsive to the output pulses of said first and second digital means for generating an error voltage, and adjusting means responsive to said error voltage for adjusting the frequency of said first and second univibrators.

3,870,970
FREQUENCY DIVIDING CIRCUIT

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Jan. 28, 1974, Ser. No. 437,200
Claims priority, application Japan, Jan. 26, 1973, 48-10276
Int. Cl. H03b *3/04*
U.S. Cl. 331—25 **3 Claims**

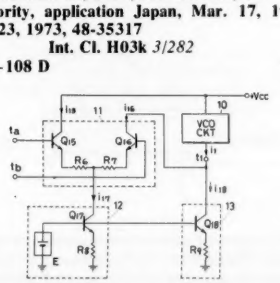


1. A frequency dividing circuit comprising a waveform memory memorizing a waveform, a voltage controlled oscillator, a counter connected to said voltage controlled oscillator to be driven thereby and connected to said waveform memory for reading out the memorized waveform, an input terminal for receiving an input signal, a $1/n$-frequency divider connected to said counter for dividing the frequency of an output from said counter into $1/n$, a $1/m$-frequency divider connected to said input terminal for dividing the frequency of the input signal into $1/m$, and a phase difference delector connected to said both frequency dividers for receiving the both frequency divided signals and connected to said voltage controlled oscillator for delivering an output voltage whenever a phase difference exists between the outputs from said $1/m$ and $1/n$-frequency dividers, the oscillation frequency of said voltage-controlled oscillator being varied in accordance with the output voltage from said phase difference detector until there exists no difference, whereby the waveform memorized in said waveform memory is successively read out at a repetition frequency equal to an n/m times the frequency of the input signal.

3,870,971
CIRCUIT ARRANGEMENT OF VOLTAGE CONTROLLED OSCILLATOR

Nobuaki Takahashi, Yamato, and Masao Kasuga, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama City, Kanagawa-ken, Japan

Filed Mar. 15, 1974, Ser. No. 451,468
Claims priority, application Japan, Mar. 17, 1973, 48-31144; Mar. 23, 1973, 48-35317
Int. Cl. H03k *3/282*
U.S. Cl. 331—108 D **7 Claims**

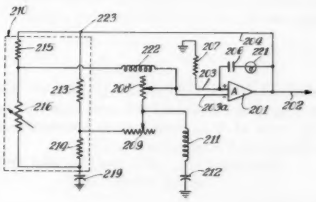


1. A circuit arrangement of voltage controlled oscillator comprising: a voltage controlled oscillator circuit part for generating a signal of a frequency proportional to an input control current; a first constant-current circuit for causing a predetermined constant current to flow; current dividing means for dividing said constant current of the first constant-current circuit in accordance with a control voltage applied from the outside; and a second constant-current circuit for causing a predetermined constant current to flow, the oscillation frequency of said voltage controlled oscillation circuit part being controlled by said input control current equal to the sum of one divided current divided by said current dividing means and the constant current of said second constant-current circuit.

3,870,972
OSCILLATOR AND FLOW MEASURING APPARATUS

Vern C. Vanderbilt, Jr., Hagerstown; Clarence L. Zimmer, Richmond, and William F. Van Ostrand, Hagerstown, all of Ind., assignors to Dynamic Precision Controls Corporation, Hagerstown, Ind.

Division of Ser. No. 43,668, June 5, 1970, Pat. No. 3,691,824.
This application July 6, 1972, Ser. No. 269,496
Int. Cl. H03b *5/26*
U.S. Cl. 331—140 **3 Claims**

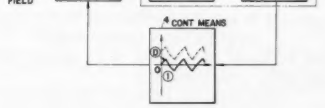


1. A variable frequency oscillator circuit comprising an amplifier including an output connection and positive and negative input connections, means connecting said output connection to said positive input connection to form a positive feedback loop, a resistance bridge including four resistance arms connected to form four bridge corners, at least one of said arms being adjustable, means connecting said output connection to one of said corners and a notch filter including, first and second variable resistors connected in series between said negative input connection and another corner which is adjacent said one corner.

3,870,973
INPUT MAGNETIC FIELD SENSING SYSTEM WITH UTILIZATION OF A HYSTERESIS PHENOMENON

Shinjiro Takeuchi, and Satoshi Ichioka, both of Toda, Japan, assignors to Mishima Kosan Co., Ltd., Kitakyushu City, Fukuoka Prefecture, Japan

Continuation-in-part of Ser. No. 264,521, June 20, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,551
Int. Cl. H03k *7/08, 9/00*
U.S. Cl. 332—12 **2 Claims**



1. An input magnetic field sensing system which utilizes a magnetic hysteresis phenomenon, comprising:

an input magnetic field converter having hysteresis characteristics for converting an input magnetic field into an electrical signal;

a shaping means coupled to said converter for shaping the output signal of the converter into a positive or negative constant voltage according to the state of said electric signal;

an integrating means coupled to said shaping means and having a delay function for integrating the output signal of said shaping means;

a control means having an input to said integrating means and an output coupled to another input of the input magnetic field converter for controlling the state of the hysteresis characteristics of said converter; and

an indicating means connected to the output of said control means for indicating the magnitude of the input magnetic field whereby an inverted signal for compensating an input magnetic field according to a signal sensed by the converter is fed back to the converter so as to form a self hysteresis oscillation system, and whereby information concerning the input magnetic field is derived and sensed from the d.c. levels of the inverted signal.

3,870,974

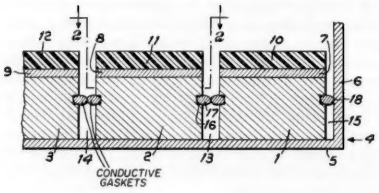
MIC CARRIER GROUNDING ARRANGEMENT

Herbert Ohlstein, Elmwood Park, and Alan H. Gruber, Cedar Grove, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 18, 1973, Ser. No. 398,354

Int. Cl. H04b *15/02*

U.S. Cl. 333—12 **8 Claims**



1. A grounding arrangement for a plurality of microwave integrated circuit carriers comprising:

a chassis having a bottom wall and at least one side wall extending from and perpendicular to said bottom wall;

said plurality of carriers being disposed in said chassis on said bottom wall in an operative relationship, at least adjacent ones of said plurality of carriers having first gaps therebetween perpendicular to said bottom wall;

a groove formed in and completely around the outer surface of each of said plurality of carriers at a given distance above said bottom wall;

a flexible conductive gasket disposed in each of said grooves, said gaskets of said adjacent ones of said plurality of carriers being disposed in contact with each other under compression to ground said first gaps.

3,870,975

SURFACE WAVE TRANSDUCER WITH REDUCED REFLECTION COEFFICIENT

Carmine F. Vasile, Greenlawn, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,617

Int. Cl. H03h *9/02, 9/26, 9/30*

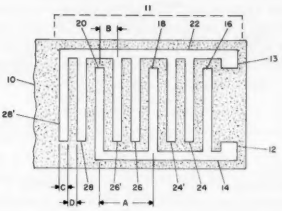
U.S. Cl. 333—30 R **6 Claims**

1. An acoustic surface wave transducer for coupling electrical signals in a selected frequency band to acoustic surface waves on a piezoelectric substrate, comprising:

a first array of conductive fingers disposed on one surface of said piezoelectric substrate and having a center-to-center spacing between adjacent pairs of conductive fingers of one acoustic wavelength at a selected frequency within said selected frequency band;

first conductive means for electrically connecting the fingers of said first array;

a second array of conductive fingers disposed on the same surface of said piezoelectric substrate and interleaved



with said first array such that there are two conductive fingers in said second array between each pair of adjacent fingers in said first array;

and second conductive means for connecting the fingers of said second array;

whereby, when electrical signals in said selected frequency band are applied across said first and second conductive means, it causes an acoustic surface wave to propagate on said piezoelectric substrate.

3,870,976

INTEGRATED ATTENUATION ELEMENT COMPRISING SEMICONDUCTOR BODY

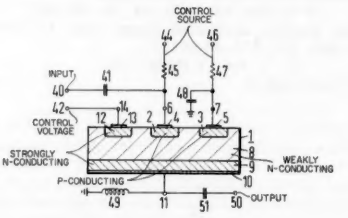
Gerhard Krause, Ebersberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 4, 1973, Ser. No. 321,031

Claims priority, application Germany, Jan. 24, 1972, 2203209

Int. Cl. H01p *1/22;* **H03h** *7/24*

U.S. Cl. 333—81 R **12 Claims**



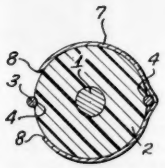
1. An integrated attenuation element having a variable attenuation characteristic for high frequency signals, comprising: a semiconductor body of one conductivity type having opposite faces, two zones of the opposite conductivity type arranged in one face of said semiconductor body, a contact electrode carried on the face of said semiconductor body opposite to that containing said two zones, one of said zones operable as an input or output and said contact electrode operable as an output or input respectively for the high frequency signals, and control sources connected to said two zones.

3,870,977

RADIATING COAXIAL CABLE

Dennis Robert Peoples, Madison, and David Ralph Maack, Meriden, both of Conn., assignors to Times Wire and Cable Companay, Wallingford, Conn.

Filed Sept. 25, 1973, Ser. No. 400,532
Int. Cl. H01q 13/22; H01p 3/06
U.S. Cl. 333—84 R 11 Claims



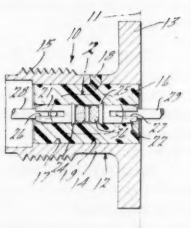
1. A radiating high frequency transmitting cable comprising:
   a. at least one center conductor;
   b. a dielectric layer enclosing said conductor;
   c. at least one field perturbing element embedded a predetermined amount in the surface of said dielectric layer, said field perturbing element having different electrical conductivity properties than said dielectric layer, and being disposed so that a major portion of its length is angularly oriented with respect to the center conductor;
   d. an outer apertured conductor and radiation shield element enclosing said dielectric layer and said field perturbing element for at least a portion of the length of the cable, and being in electrically conductive contact with said field perturbing element, the aperture feature of said shield element leaving at least a portion of said field perturbing element and adjacent dielectric layer unshielded in an area of the cable covered by said shield element.

3,870,978

ABUTTING ELECTRICAL CONTACT MEANS USING RESILIENT CONDUCTIVE MATERIAL

Charles W. Dreyer, Plymouth, Mich., assignor to Omni Spectra, Inc., Farmington, Mich.

Filed Sept. 13, 1973, Ser. No. 397,022
Int. Cl. H01p 1/04; H01r 3/00, 13/24
U.S. Cl. 333—97 R 20 Claims



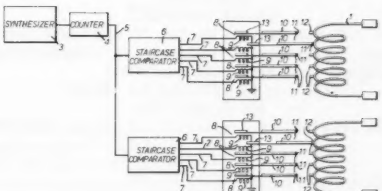
1. Abutting electrical contact means comprising first and second aligned elongated conductors of electrically conductive relatively rigid material, tubular dielectric member means within which said conductors are disposed, said conductors having end surfaces in facing relation, the diameters of said conductors being substantially equal to the bore within said dielectric member means, and at least one contact block disposed between said facing surfaces, said contact block being fabricated of resilient conductive material whereby thermal expansion and contraction, shock and vibration of said conductors in an axial direction will be absorbed by said block, said contact block being compressed when in its operative position so that at least a substantial portion thereof is spread outwardly against the inner wall of said dielectric member means.

3,870,979

TUNING ARRANGEMENTS

Roderick Carey Baxter, Chelmsford, and Dennis Edward Hart, Maldon, both of England, assignors to The Marconi Company Limited, Chelmsford, Essex, England

Filed Jan. 8, 1974, Ser. No. 431,706
Claims priority, application Great Britain, Jan. 19, 1973, 3018/73
Int. Cl. H03j 5/18, 5/22
U.S. Cl. 334—14 6 Claims



1. An arrangement for tuning simultaneously a plurality of tunable elements comprising means for generating a signal representative of the required tuning frequency and a plurality of comparators each of said comparators associated with a different element to be tuned and arranged to receive as an input signal said representative signal and to provide in dependence upon the desired tuning frequency an output signal on an appropriate one of a plurality of outputs, each output corresponding to a different predetermined tuning adjustment of the associated component, each of said comparators comprising a plurality of detectors each arranged to receive as two input signals said representative signal and a signal of predetermined magnitude which said magnitude corresponds to a predetermined tuning adjustment and is different for each detector and to provide an output when the two input signals are substantially equal in magnitude.

3,870,980

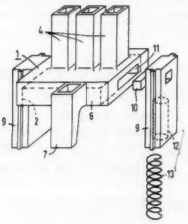
ELECTRICAL CONTACT CARRIER FOR ELECTRICAL CIRCUIT BREAKERS

Fritz Pollmann, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 27, 1973, Ser. No. 401,285
Claims priority, application Germany, Sept. 29, 1972, 2248029
Int. Cl. H01h 50/04
U.S. Cl. 335—202 5 Claims

1. In an electrical circuit breaker, of the type including a movable carrier member for the electrical contacts thereof which is slidably disposed within a circuit breaker housing and includes elongated lateral guide members mounted on opposing sides of the carrier member, and disposed in guide slots provided in the housing, for guiding the carrier member therein, the improvement comprising, an additional guide member, disposed on a side surface of said carrier member

joining said opposing sides between said lateral guide members, said circuit breaker housing including an additional guide slot for receiving said additional guide member and guiding said carrier member therein.



3,870,981

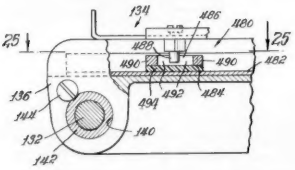
BRAKE ASSEMBLY

Robert C. Patzke, Prospect Heights, Ill., and Joseph Goebel, Hague, Netherlands, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 16, 1973, Ser. No. 388,963

Int. Cl. H01f *7/00*

U.S. Cl. 335—296 **12 Claims**



1. A device for controlling the movement of a member movable along a first path of travel comprising

a movable magnetic means engageable by a first portion of said member, said magnetic means being movable by said first portion along a second path of travel substantially parallel to said first path of travel and

means for guiding said magnetic means to restrict the movement of said magnetic means to movement along said second path of travel, said guiding means being magnetically response to said magnetic means to thereby provide a force in opposition to the movement of aaid magnetic means.

3,870,982

IMPREGNATED ELECTROMAGNETIC COIL HAVING A LAYER VOLTAGE APPLIED THERETO

Takashi Shibano, Suita; Koichi Hirakawa, Kawanishi, and Toshimitsu Yonehara, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

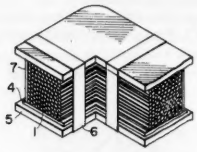
Filed Apr. 2, 1973, Ser. No. 347,041

Claims priority, application Japan, Mar. 31, 1972, 47-32781

Int. Cl. H01f *3/00*

U.S. Cl. 335—297 **4 Claims**

1. An electromagnetic coil comprising an elementary electromagnetic coil composed of a self-bonding electric wire wound in the form of a plurality of layers and having no interlayer insulating paper; impregnable ring-shaped insulating sheets closely fitted to and secured on each side of said elementary coil, to which a layer voltage is applied, to allow said wire at each of said coil sides to be embedded in one of said insulating sheets; and a varnish impregnated and hardened in said elementary coil to make the electromagnetic coil void-free between said coil sides and said insulating sheets to prevent an arc discharge from being generated between coil layers along a surface of each of said coil sides.



3,870,983

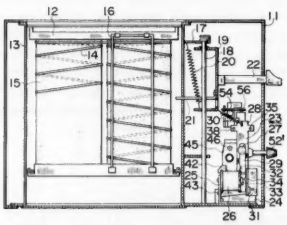
HEAT-SENSITIVE DEVICE

Nobuo Kato, Ikeda; Toshio Nakamura, and Seishi Terakado, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1972, Ser. No. 318,643

Int. Cl. H01h *61/02*

U.S. Cl. 337—107 **10 Claims**



1. A heat sensitive device comprising heat sensitive means comprising an electric heating wire, bimetal means, and metal means having a heat storaging function thermally arranged in series with said wire and bimetal means for controlling the amount of heat to be transmitted from said wire to said bimetal means, said heat being generated by said heating wire; and means for providing an output responsive to heating or cooling of said heat sensitive means.

3,870,984

HIGH-VOLTAGE FUSE WITH PLUGS OF SHEET METAL

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Feb. 20, 1974, Ser. No. 444,095

Int. Cl. H01h *85/02*

U.S. Cl. 337—161 **6 Claims**

1. An electric fuse including

a. a tubular casing of electric insulating material;

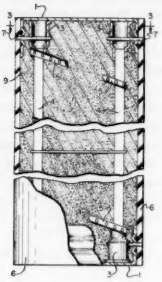
b. substantially helically wound fusible element means in ribbon form arranged inside of and in coaxial relation to said casing;

c. a pulverulent arc-quenching filler inside said casing embedding said fusible element means;

d. a plurality of separate angularly displaced rods of electric insulating material arranged parallel to the axis of said casing supporting said fusible element means;

e. a pair of hollow plugs of sheet metal closing the ends of said casing, said pair of plugs having end surfaces and having lateral surfaces engaging the inner surface of said casing and being provided with a sealing-medium-

containing groove means; and

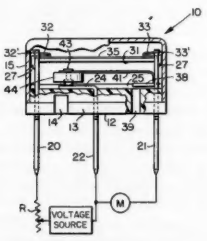


f. a plurality of sheet metal supports for said plurality of rods affixed to said end surfaces of said pair of hollow plugs and engaged by the ends of said plurality of rods.

3,870,985
THERMOSTATIC SWITCH WITH SOLID STATE HEATER

Charles John Hire, Pittsford, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,115
Int. Cl. H01h *37/04, 37/12*
U.S. Cl. 337—381 **10 Claims**



1. A thermostatic switch, comprising

a housing having therein a chamber and a hole connecting the chamber to the exterior of the housing,

three spaced electrically conductive terminals secured to said housing, each having its opposite ends, respectively, projecting into said housing and extending exteriorly of said housing,

an electrically operable heater element mounted in said chamber and connected at opposite ends to two of said terminals,

a metal tab secured to and projecting from one of said two terminals and registering with said hole,

a flexible, bi-metallic switch arm mounted in said housing adjacent said heater element and having a free end overlying the third of said three terminals,

an electrical contact secured on said free end of said arm, and

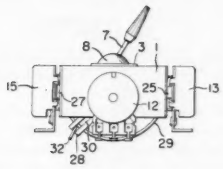
means securing the opposite end of said arm to said tab for pivotal movement, upon predetermined changes in its ambient temperature, between a position in which the contact on the free end of said arm is in engagement with said third terminal and a position in which said contact is disengaged from said third terminal,

said tab being bendable manually by an instrument insertable through said hole in said housing to vary the tension in said arm.

3,870,986
DEVICE FOR SIMULTANEOUSLY CONTROLLING A PLURALITY OF VARIABLE RESISTORS

Shunzo Oka, Osaka, and Matsuo Nishioka, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma-shi, Osaka-fu, Japan

Filed Dec. 19, 1972, Ser. No. 316,586
Claims priority, application Japan, Dec. 24, 1971, 47-56|U|; Mar. 17, 1972, 47-32673|U|
Int. Cl. H01c *5/00*; **G05g** *9/02*
U.S. Cl. 338—128 **2 Claims**



1. In a device for simultaneously controlling a plurality of variable resistors of the type in which a pair of molded bearing members each having a bearing surface which is a part of a spherical surface are securely fixed to the top of an electrically conductive casing having four side walls in coaxial relation with a center hole formed in the top of said casing;

a ball member having an operating shaft extending through the center thereof is rotatably supported by said pair of bearing members; variable resistors are fixed on the side walls of said casing in such a manner that their shafts extend through each side wall into said casing; and the end of said operating shaft is slidably fitted into elongated slots formed in bow-shaped elastic connecting members each connecting the opposed shafts of said variable resistors,

a member having a plurality of elastic projections interposed between said ball member and said pair of bearing members so as to contact said ball member and to bias it toward one of said pair of bearing members, and

said pair of bearing members and said ball member being of an electrically conductive material electrically connected to the casing.

3,870,987
IGNITION CABLE

Robert Emerson Wiley, and James John Coniglio, both of Port Huron, Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed May 29, 1973, Ser. No. 364,751
Int. Cl. H01g *3/00*
U.S. Cl. 338—214 **20 Claims**

1. In an ignition cable for use with vehicle engines having spark ignition, the improved construction comprising:

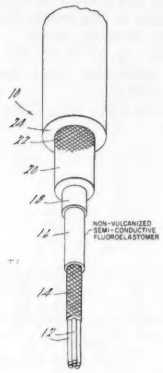
a flexible resistive conductor means for conducting electrical current to provide ignition,

a flexible coating layer having controlled electrical resistance generally surrounding the resistive conductor means, said layer being comprised of,

about 50 percent to about 90 percent by weight of fluoroelastomer providing the coating with sustained thermal resistance on exposure to temperatures of about 500° F or higher,

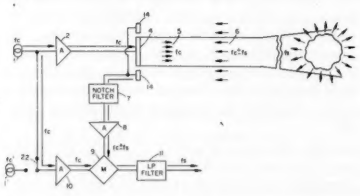
about 10 percent to about 50 percent by weight of conductive pigment for providing conductivity to the coat-

ing, and
about 0.05 percent to about 15 percent by weight of flow



control agent for facilitating application usage of the coating.

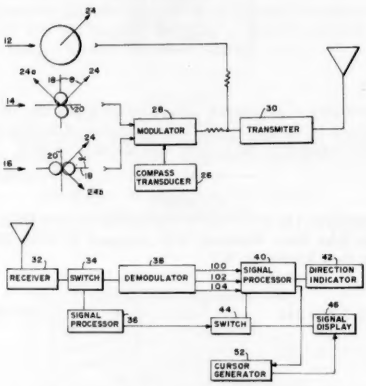
3,870,988
HYBRID CARRIER BEAM SONAR
William R. Turner, Rockville, Md., assignor to Automation Industries, Inc., New York, N.Y.
Filed Jan. 14, 1969, Ser. No. 791,882
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **10 Claims**



1. The method of ultrasonic detection and identification of objects having distinctive sonic signatures in a liquid propagation medium comprising the steps of
a. projecting high frequency ultrasound illumination towards the object;
b. obtaining reflected scatter of the same frequency;
c. cross-modulating the scatter signal with the signature signal of the object within the propagation medium to generate side band frequencies;
d. receiving the side band frequencies and;
e. processing said received side band frequencies to eliminate the initial illuminating frequency and to obtain the signature of the object.

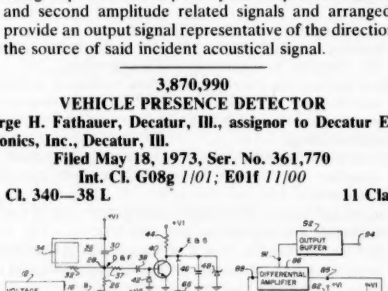
3,870,989
UNDERWATER DIRECTION SIGNAL PROCESSING SYSTEM
Alfred L. Mallet, Pittsfield, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Mar. 16, 1970, Ser. No. 19,979
Int. Cl. G01s *3/80*
U.S. Cl. 340—6 R **14 Claims**

1. A direction-finding system for ascertaining the bearings of sources of incident acoustical signals in water, said system having a plurality of transducers for converting said acoustical signals into at least a first and second electrical signals with said electrical signals comprising a plurality of frequency components, said transducers each generating an electrical signal that varies as a function of the angle between a sensitive axis of said transducer and the direction of the incoming acoustical signals with the sensitive axis of said transducers being oriented at a predetermined angle with respect to each other and to a known geographical reference; wherein the improvement comprises:
a. frequency separating means adapted to receive first and second electrical signals, said frequency separating means arranged for separating each of said first and second electrical signals according to the frequency components thereof and to select a discrete frequency component in each of said electrical signals for processing;



b. means for converting said selected frequency component of said first and second electrical signals to first and second amplitude related signals, the ratio of said first and second amplitude related signals corresponding to the tan of the bearing of said acoustical signal and the relative polarity of said first and second amplitude related signals being indicative of the quadrant containing the incident acoustical signal as measured from said known geographical reference, and
c. bearing computation means, said computation means being responsive to the polarity and amplitude of said first and second amplitude related signals and arranged to provide an output signal representative of the direction of the source of said incident acoustical signal.

3,870,990
VEHICLE PRESENCE DETECTOR
George H. Fathauer, Decatur, Ill., assignor to Decatur Electronics, Inc., Decatur, Ill.
Filed May 18, 1973, Ser. No. 361,770
Int. Cl. G08g *1/01*; **E01f** *11/00*
U.S. Cl. 340—38 L **11 Claims**



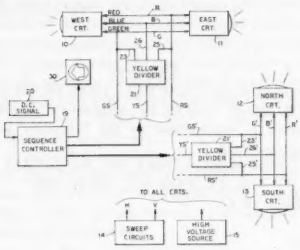
1. A presence detector circuit for operation in conjunction with a detector loop and comprising:

a source of electrical pulses;
circuit means for coupling to said detector loop to form a tuned circuit and producing an output signal in response to said electrical pulses;
clamping means coupled to said source and said circuit means for clamping the portion of said output signal occurring at predetermined times relative to the occurrence of said pulses at a predetermined value;
means for producing an electrical signal representative of an average value of said clamped output signal; and
output means for providing an indication of the presence of an object in response to changes in said electrical signal.

3,870,991
TRAFFIC CONTROL SIGNAL APPARATUS

Royce Hayes, 2785 Shallowford Rd., Chamblee, Ga. 30341

Filed Feb. 11, 1974, Ser. No. 441,638
Int. Cl. G08g *1/095*
U.S. Cl. 340—41 R **8 Claims**

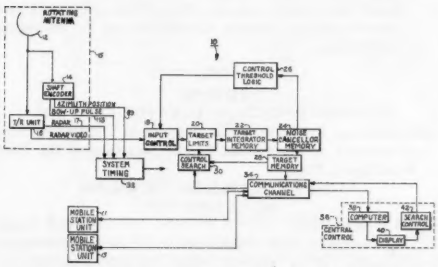


1. Traffic control signal apparatus, comprising:
CRT means positioned in signal display relation to a traffic path and selectively operative to emit a plurality of colors in response to input signals; and
sequence control means operatively connected to supply said CRT means with input signals to provide certain traffic control colors in predetermined repetitive sequence.

3,870,992
RADAR SYSTEM

Drexel W. Hanna, Jr., Warminster, Pa., assignor to All Systems, Moorestown, N.J.

Filed Apr. 26, 1972, Ser. No. 247,568
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 DP **3 Claims**

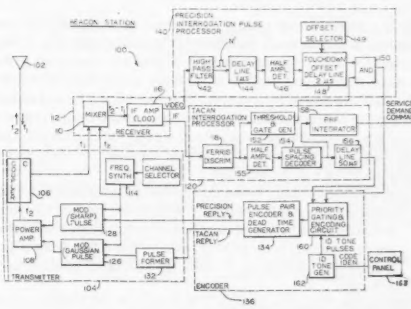


1. In a radar system, a plurality of moving radar stations and a central data processing station, in which each moving station develops target information and transmits the target information to the central data processing station over a time-shared communications channel, and in which each radar station includes a memory device for retaining target data to be transmitted to the central station;
the method of developing target data in high density target areas for each of said moving stations, comprising the steps of:
a. developing said target data during each target frame in moderate density areas and transmitting the developed data to the central station;
b. during each target frame in high density areas, detecting when the target storage device is full of target data, and registering the azimuth at which the memory device becomes full and transmitting the target data from an initial azimuth until the memory-full azimuth;
c. and following thereupon during the next frame, storing target data starting with the memory-full azimuth and continuing on therefrom and storing the target data for transmission to the central station until the memory device becomes full or the frame is completed;
whereby in high density areas target data is fully developed in surrounding regions over a plurality of frames.

3,870,993
DISTANCE MEASURING EQUIPMENT FOR AIRCRAFT EMPLOYING PRECISION DISTANCE MEASURING MEANS

Alvaro D. Biagi, Huntington Station, and Dimitri Luganski, Huntington, both of N.Y., assignors to Republic Electronics Industries Corporation, Huntington Station, N.Y.

Filed May 21, 1973, Ser. No. 362,441
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 R **11 Claims**



1. A system for measuring the distance between an aircraft and a beacon station comprising an airborne measuring equipment, said equipment comprising:
antenna means for radiating wavetrains of a plurality of interrogation pulses from said aircraft to said beacon station and for picking up a plurality of reply pulses therefrom;
distance measuring apparatus in circuit with said antenna means, comprising:
a transmitting means for generating said interrogation pulses, and
a first receiving means for receiving said reply pulses and converting the same into data representing the approximate distance between said aircraft and said beacon station; and
a high precision distance measuring apparatus comprising:
a pulse modulation means in circuit with said transmitting means for imposing a notch on one pulse of each consecutive pair of said interrogation pulses;
a second receiving means in circuit with said antenna means for receiving from said beacon station a special reply pulse having a fast rise time generated at said beacon station in response to reception there of said notched interrogation pulses; and
computer means in circuit with said second receiving means for measuring the time interval between the instant of notching the first interrogation pulse and the instant of reception of said special reply pulse having a fast rise time, and for producing data corresponding to said time interval and representative with high preci-

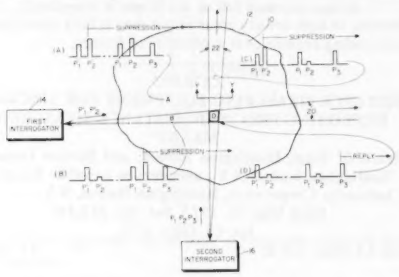
sion of the distance between said aircraft and said beacon station.

3,870,994

GEOGRAPHIC ADDRESSING BY INTERROGATION FOR CONTROLLING AIRPORT GROUND TRAFFIC

Joseph L. McCormick; Charles G. McMullen, and Phillip J. Woodall, all of Baltimore, Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 22, 1972, Ser. No. 317,856
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 R **7 Claims**



6. In a transponder system comprised of a plurality of transponders wherein each transponder characteristically is suppressed for a first predetermined period of time after a first message is received, said first message being comprised of a pulse pair separated by a second predetermined period of time and having a predetermined amplitude relationship, one with the other, and wherein each said transponder characteristically responds to a second received message so long as said transponder is not suppressed,

said second message being comprised of a second pulse pair separated by a third predetermined time period, said third predetermined time period being longer than said second predetermined time period, means for addressing a geographically individual portion of a field of interest comprising:

first means for transmitting said first message over said field of interest except along a first relatively narrow beam;

second means spaced apart from said first means for transmitting a further message over said field of interest, said further message being comprised of a pulse triad, the first and second pulses in said pulse triad being separated by said second predetermined period of time and the first and third pulses of said pulse triad being separated by said third predetermined period of time, said second means for transmitting including means for nulling transmission of said second pulse along a second relatively narrow beam in said field of interest whereby a transponder located in the intersection of said beams will respond and a transponder located outside the intersection of said beams will not respond.

3,870,995

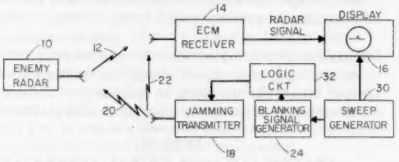
ELECTRONIC COUNTERMEASURES SYSTEM

Robert L. Nielson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1971, Ser. No. 119,032
Int. Cl. H04k *3/00*
U.S. Cl. 343—18 E **4 Claims**

1. In a countermeasures system including an ECM receiver associated with a cathode-ray beam indicating device on the screen of which may be displayed a visual indication representative of the signal received from an enemy radar, and wherein a transmitter is employed to send out a jamming signal on a frequency essentially identical to that of such radar in order to confuse the enemy operator thereof, the improvement which comprises

means for preventing the visual indication on said screen representative of such jamming signal from obscuring the visual indication representative of said radar signal, so as to enable the operator of said ECM receiver to monitor both such indications concurrently, said means including



means for selectively interrupting the operation of said jamming signal transmitter synchronously with the deflection of the cathode-ray beam of said indicating device and in time coincidence therewith,

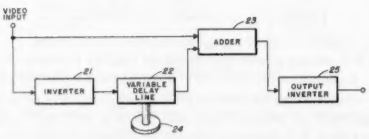
said interrupting means operating during every Nth deflection of said beam, with N being equal to at least two.

3,870,996

JAMMING CANCELLATION DEVICE

Raymond B. Miller, Glencoe, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 16, 1963, Ser. No. 309,358
Int. Cl. H04b *1/12*; **H04k** *3/00*
U.S. Cl. 343—18 E **5 Claims**



5. A method of canceling out interfering modulations present in a radar video signal without causing degradation to the desired signal information comprising the steps of:

inverting the polarity of a video signal that has interfering modulations present;

delaying the polarity inverted video signal by manual adjustment equal to or greater than one-half the period of the lowest interfering modulation signal frequency; and

adding the delayed and polarity inverted signal to an undelayed video signal in proper phase relationship with each other to effect complete cancellation of the interfering modulations.

3,870,997

AUTOMATIC GAIN INTEGRATOR CONTROL

John DiPerry, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1965, Ser. No. 431,491
Int. Cl. G01s *7/36*
U.S. Cl. 343—18 E **3 Claims**

1. In a radar counter-countermeasure system, including the combination of a normal radar system and counter-countermeasure circuitry, a radar receiver comprising:

a. an IF amplifier whose signal input is received from the pre IF stage of a normal radar system,

b. an IF limiter to which the output of said IF amplifier is fed,

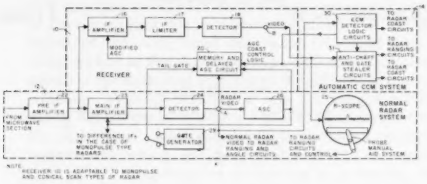
c. a video detector connected to the output of said IF limiter,

d. the video signal output of said detector being fed to counter-countermeasure circuitry and operator range scope of said normal radar system,

e. a memory and delayed AGC circuit means whose output is connected to and controls the gain of said IF amplifier for maintaining the target IF signal at desired operating threshold level,

f. radar video, AGC, and gate signals from the normal radar system being fed to said memory and delayed AGC circuit at respective inputs thereto,

g. said memory and delayed AGC circuit also being connected to the counter-countermeasure circuitry for receiving control signals therefrom,



h. said memory and delayed AGC circuit providing delayed AGC voltage during normal target tracking, and providing AGC memory during periods of interference by storing the last gain setting and coasting at that setting upon receiving said control signals from the counter-countermeasure circuitry,

wherein target video signal level suppression resulting from intentional and unintentional interferences is prevented and target video signal level at the output of said detector is controlled only by AGC action caused by the target itself even in the presence of interference.

3,870,998

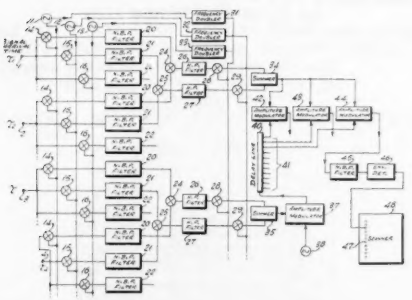
APPARATUS FOR MEASURING AND SUMMING TIME DIFFERENCES

Gordon C. Dewey, New York, N.Y., and James F. Bartram, Darien, Conn., assignors to The Dewey Electronic Corporation, New York, N.Y.

Filed Jan. 22, 1959, Ser. No. 788,462

Int. Cl. G06f *15/34*

U.S. Cl. 343—100 CL **8 Claims**



1. Apparatus for obtaining a linear combination of the time delays of a plurality of continuous wave signals comprising a plurality of input terminals on each of which one of said signals is adapted to be impressed, a plurality of channels connected to each terminal including narrow band pass filters having the same frequency band, frequency transposing means connected to each of said terminals for transposing the various portions of the frequency spectrum of the signals to said frequency band, a plurality of first multiplier circuits each connected to at least one of said filters, a high pass filter connected to the output of each of said multiplier circuits for selecting and passing the sum frequency of the multiplier circuits, frequency translating means for restoring the outputs of the multiplier circuits to their relative positions in the signal spectrum, a first summing circuit connected to the frequency translating means which are connected to selected ones of said terminals, a second summing circuit connected to the frequency translating means which are connected to other selected input terminals, a delay line having a plurality of outlet taps at different delay points therealong, means for impressing the output of the second summing circuit on the input of said delay line, a combining circuit connected to each of the taps, means connecting the first summing circuit to each combining circuit, and means for sensing the outputs of the combining circuits.

3,870,999

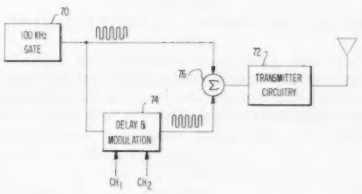
COMMUNICATIONS VIA LORAN NAVIGATION PULSES

Carl S. Mathews, Annandale, and Arnold Swagerty, Vienna, both of Va., assignors to A-T-O Inc., Willoughby, Ohio

Filed June 29, 1973, Ser. No. 375,234

Int. Cl. G01s *1/24*

U.S. Cl. 343—103 **26 Claims**



1. A system for communicating additional information via a Loran pulsed navigation system, said pulsed navigation system being of the type which periodically transmits navigation pulses having a point thereon, time separated from the pulse beginning, which is used for accurate navigation position detection, said system comprising;

a. modulation means responsive to said additional information for phase shifting a portion of the carrier frequency of said pulse an amount dependent upon the content of said information, said portion excluding said navigation point, and

b. means for transmitting said modulated pulse.

3,871,000

WIDE-BAND VERTICALLY POLARIZED OMNIDIRECTIONAL ANTENNA

Gerhard Tymann, Unterhaching, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft Mit Beschrankter Hoftung, Munich, Germany

Filed Nov. 30, 1973, Ser. No. 420,581

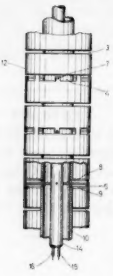
Claims priority, application Germany, Dec. 2, 1972, 2259082

Int. Cl. H01q *13/10*

U.S. Cl. 343—771 **12 Claims**

1. A wide-band vertically polarized omnidirectional antenna comprising a first hollow cylindrically-shaped metal surface divided transversely of its axis by a circumferentially extending slot into at least two hollow cylindrically-shaped rings having an axial length of ¼ or ½ of the wavelength, three-wire lines distributed uniformly over the circumference of said first metal surface for feeding said slots, and a second hollow cylindrically-shaped metal surface arranged within and coaxially with said first metal surface as a support, wherein the improvement comprises that said slot is formed of a plurality of circumferentially extending individual slots uniformly spaced apart in the circumferential direction and forming a circumferentially extending interrupted ring slot, one said three-wire line for feeding each said individual slot, at least one coaxial conductor positioned within said second metal

surface, said second metal surface and said coaxial conductor arranged as a coaxial feeder system, said three-wire line comprising inner wires extending radially inwardly from said first metal surface, said second metal surface having bores there-

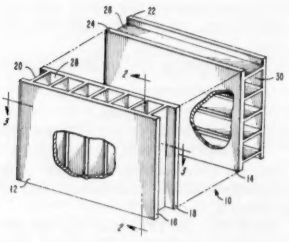


through aligned with said inner wires so that said inner wires pass contact-free through said second metal surface and are coupled capacitatively or galvanically with said coaxial conductor.

3,871,001
RADOME

Hubert A. Myers, Los Angeles, Calif., assignor to Hitco, Irvine, Calif.

Filed Nov. 15, 1972, Ser. No. 306,884
Int. Cl. H01q 1/42
U.S. Cl. 343—872 **10 Claims**

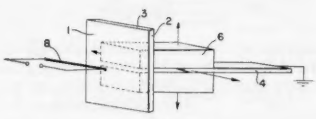


1. A radome comprising first and second generally sheet-like elements joined together to form a laminate, each of the sheet-like elements having opposite broad surfaces and a plurality of elongated spaces disposed within the sheet-like element intermediate the opposite broad surfaces and spaced-apart across the sheet-like element to define a plurality of elongated ribs therebetween, the elongated spaces and the ribs formed therebetween extending generally in a common direction, each of the sheet-like elements distorting electromagnetic wave energy which passes therethrough in predictable fashion, the ribs of the first sheet-like element being oriented relative to the ribs of the second sheet-like element so that distortion of electromagnetic wave energy which has passed through the first sheet-like element is substantially balanced by distortion of the electromagnetic wave energy after it has passed through the second sheet-like element.

3,871,002
APPARATUS FOR DEFORMING A THERMOPLASTIC LAYER USING A SHAPED COOLING TEMPLATE

Gunther Schadlich, Wiesbaden, and Roland Moraw, Naurod ub. Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Division of Ser. No. 206,604, Dec. 10, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,685
Claims priority, application Germany, Dec. 14, 1970, 2061417
Int. Cl. G01d 9/00
U.S. Cl. 346—74 TP **8 Claims**

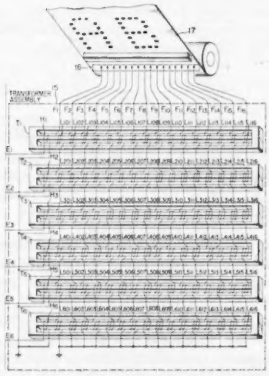


1. Apparatus for deforming a photoconductive thermoplastic layer of a recording material by forming an electrostatic image thereon and heating it, which comprises mounting means for said recording material, charging station means for charging said material, exposure station means for exposing said material, heating station means for developing said material, and deformation means including a heat source on the side of the thermoplastic layer and shaped cooling template means adapted to contact said material from the side opposite to the thermoplastic layer, whereby said layer is deformed in a selected area in conformity with the area of said template means not in contact with said material.

3,871,003
ELECTROSTATIC RECORDING APPARATUS WITH CORE MATRIX

Mamoru Kondo, and Morio Kobayashi, both of Mito, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,596
Claims priority, application Japan, Aug. 14, 1972, 47-81258; Sept. 4, 1972, 47-88845
Int. Cl. G01d 15/06; H04l 15/34
U.S. Cl. 346—74 ES **18 Claims**



1. An electrostatic recording apparatus comprising a transformer assembly comprising

a plurality of cores equal in number to a length of code words of a predetermined error correcting code,

a plurality of primary windings wound on said plurality of cores, respectively, and

a plurality of selecting lines the number of which is equal to the number of the code words of said error correcting code at most and each of which comprises a plurality of series-connected secondary windings wound on said cores, respectively, in accordance with the elements of each of the code words of said error correcting code;

means for energizing said plurality of primary windings with a set of energizing current for selecting a desired one of said selecting lines, each current that composes said set of energizing currents corresponding to each of the elements of the code word associated with said desired selecting line so that the secondary voltages of a predetermined magnitude may be induced across said secondary windings, thereby inducing a selected output voltage across said selected selecting line while inducing across the remaining selecting lines spurious output voltages, respectively, which are lower than said selected output voltage by a magnitude in proportion to a distance between the code word associated with said selected line and each code word associated with each remaining selecting lines;

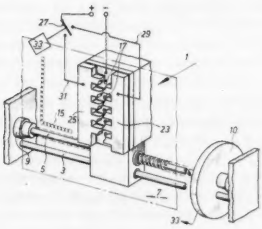
means for generating a set of signals in response to the input information so that the generated set of signals may be amplified to produce said set of energizing currents which may be applied to said primary windings of said transformer assembly to induce said selected output voltage across said selected selecting line; and

means for forming electrostatic images, impressing said selected output voltage upon a plurality of electrodes connected to said selecting lines, on a recording medium located in contact with said electrodes, the magnitude of said selected output voltage being so chosen that the input information may be recorded upon said electrostatic recording medium by the discharge between said medium and said selected electrode upon which is impressed said selected output voltage while said spurious output voltage may make no recording due to the threshold characteristics of the discharge between said recording medium and the remaining electrodes upon which said spurious output voltages are impressed.

3,871,004
INK DROP WRITING HEAD

Eilt-Heyo Rittberg, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed June 26, 1974, Ser. No. 483,282
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **4 Claims**

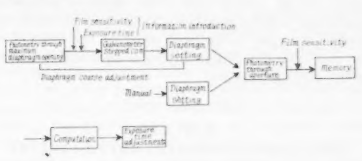


1. In a writing head for producing, on a record carrier, a high resolution character formed of drops of a writing fluid the head including a cover member and a plurality of writing fluid drop ejectors each composed of a fluid chamber communicating with a writing fluid reservoir, an ejector nozzle communicating with the chamber and constituted by an opening in the cover member, and an individually excitable pressure pulse generator arranged to apply pressure pulses to the fluid in the chamber for ejecting drops of writing fluid from the nozzle, the plurality of nozzles being aligned in a row and the head being arranged to be positioned with the row of nozzles facing the record carrier so that fluid drops are ejected from the nozzles toward the record carrier the improvement comprising: at least one electrode member disposed adjacent all of said nozzles and mounted between said cover member and the location in which the record carrier writing surface is to be disposed during writing; and means for selectively applying a voltage differential between said cover member and said electrode member for producing an electric field which polarizes charge carriers contained in the electrically neutral writing fluid drops ejected from said nozzles and thus creates an attractive force between each such drop and said electrode member; and wherein said electrode member is configured to constitute means for causing the direction of such field to cause such attractive force to deflect the ejected writing fluid drips in a direction which is transverse to the row in which said nozzles are aligned and which has a component parallel to such row.

3,871,005
AUTOMATIC EXPOSURE CONTROL MEANS FOR A CAMERA

Yasuo Uchida, and Yoshitaka Kuroyanagi, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1972, Ser. No. 306,393
Claims priority, application Japan, Nov. 17, 1971, 46-91479; Feb. 17, 1972, 47-16649
Int. Cl. G03b *7/08*
U.S. Cl. 354—38 **3 Claims**



1. An automatic exposure control means for a camera comprising first exposure adjusting means having a diaphragm which is preset and moved from a full opened state to a reduced state upon camera release operation, said first exposure adjusting means comprising a first light measuring member and means responsive to the output from said first light measuring member for presetting the aperture value, second exposure adjusting means comprising a second light measuring member for receiving light which has passed through the reduced aperture and means for determining an exposure time in response to the output from said second light measuring member.

3,871,006
AUTOMATIC DIAPHRAGM SETTING APPARATUS FOR CAMERA

Hideo Takeuchi, Kozakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Higashiku, Osaka, Japan

Filed Sept. 12, 1973, Ser. No. 396,655
Claims priority, application Japan, Sept. 18, 1972, 47-108890
Int. Cl. G03b *9/04*
U.S. Cl. 354—40 **2 Claims**

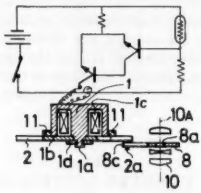
1. An automatic diaphragm setting apparatus in a camera comprising:

means including an electric circuit having a current source and a photoelectric cell for detecting the brightness of a subject and producing an on or off electric signal;

an electromagnet including a stationary iron core having a planar attracting face and a stationary coil connected to the electric circuit, said electromagnet being energized in

response to the photoelectric cell of the electric circuit detecting subject brightness below a predetermined value and deenergized in response to the photoelectric cell detecting subject brightness above said predetermined value;

a diaphragm setting member pivoted at the center of the electromagnet and rotatable on the planar attracting face of the electromagnet and spring urged to rotate from a cocked first position to a released second position at the time of the camera shutter release, said diaphragm setting member remaining attracted and retained in the first



position when the electromagnet is energized and moving to the second position when the electromagnet is deenergized;

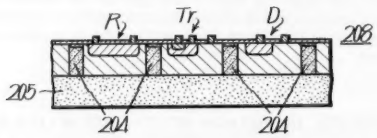
a diaphragm member having a smaller first aperture and a larger second aperture and being movable across an optical axis of an objective lens in relation to the diaphragm setting member, said first aperture being positioned on the optical axis of the objective lens when the diaphragm setting member is in the first position and said second aperture being positioned on the optical axis of the objective lens when the diaphragm setting member is in the second position.

3,871,007

SEMICONDUCTOR INTEGRATED CIRCUIT

Kinji Wakamiya, Tokyo, and Isamu Kobayashi, Kanagawaken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1969, Ser. No. 881,452
Claims priority, application Japan, Dec. 5, 1968, 43-89227
Int. Cl. H01l *19/00*
U.S. Cl. 357—49 **1 Claim**



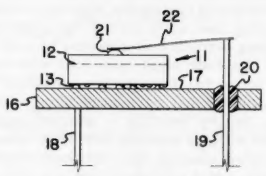
1. An integrated circuit wafer having islands of monocrystalline semiconductor material separated from each other by polycrystalline regions comprising a supporting layer of high resistivity polycrystalline silicon material, a continuous layer of semiconductor material having regions of high resistivity polycrystalline silicon material formed over predetermined areas of said supporting layer, and monocrystalline regions formed over the remaining areas of said supporting layer, said polycrystalline regions and said polycrystalline supporting layer having an impurity concentration of less than 7×10^{17} atoms/cm^3, said polycrystalline supporting layer and said polycrystalline regions of said epitaxial layer being the sole means of electrically isolating said monocrystalline regions from each other.

3,871,008

REFLECTIVE MULTIPLE CONTACT FOR SEMICONDUCTOR LIGHT CONVERSION ELEMENTS

John R. Debesis, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,935
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 357—65 **4 Claims**



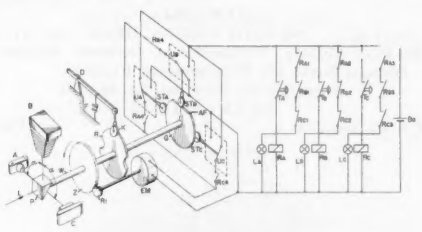
1. A contact construction for attaching a solid state light conversion element to a conductor member, comprising a plurality of individual raised electrical contact areas distributed over and attached to a surface of said light conversion element, said element being positioned with said surface adjacent to a surface of said conductor member, and bonding means attaching the outer tips of at least some of said raised contact areas to said surface of the conductor member and providing electrical connection therebetween, a major portion of said surface of the light conversion element being free from contact with solid matter.

3,871,009

PHOTOMICROGRAPHIC APPARATUS

Alfred Steinbatz, and Gerhard Kappl, both of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed Mar. 18, 1974, Ser. No. 452,178
Claims priority, application Austria, Mar. 30, 1973, 2803/73
Int. Cl. G03b *27/44*
U.S. Cl. 354—79 **7 Claims**

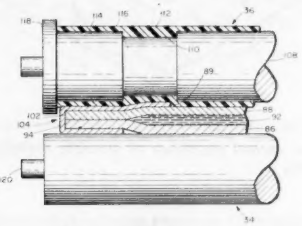


1. Apparatus for selectively diverting an optical path in a microscope attachment to one of a plurality of cameras radially positioned around said path, said apparatus comprising a rotatable light reflector having said plurality of cameras radially positioned therearound, motor means for rotating said reflector, indexing means for accurately positioning said reflector with respect to each of said cameras, each of said cameras having a motor control circuit to rotate said reflector and divert light to a selected one of said cameras, each said motor control circuit including a relay to connect motor operating voltage to said motor means, a manual switch to connect said relay solenoid to relay operating voltage and for concurrently preventing connection of other motor control circuits to said motor operating voltage, and means to short circuit said motor means to rapidly stop rotation of the reflector permitting accurate positioning of the reflector by said indexing means.

3,871,010
SPREAD ROLLER SYSTEM FOR SELF DEVELOPING TYPE PHOTOGRAPHIC APPARATUS

James M. Whall, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1974, Ser. No. 466,416
Int. Cl. G03b 17/50
U.S. Cl. 354—86 12 Claims



1. Photographic apparatus including means for spreading a processing fluid in a layer between first and second superposed sheet elements, at least one of the elements forming part of an exposed rectangular area of a film unit, the elements secured in superposed relationship by spaced apart longitudinal edge binding means secured to the external surfaces of the sheets and overlapping longitudinal edge of the elements, the binding means extending inwardly from the longitudinal edges of the first element on the external surface thereof to define lateral edges which in part define the exposure area and inwardly from the longitudinal edges of the second element to a distance shorter than the inward extension on the surface of the first element, the elements thus secured having longitudinal margin portions of greater thickness than the portions thereof intermediate the longitudinal edges, said spreading means comprising:

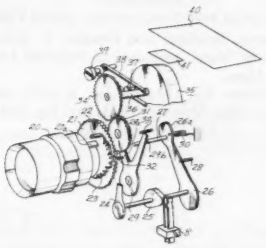
a first member having a first sheet-contacting surface; and

a second member mounted in juxtaposed relation to said first member and adapted to define a pressure generating gap therewith through which the sheet elements are adapted to be advanced during spreading of the processing fluid, said second member including a generally rigid support member, means defining a pair of laterally spaced apart recesses in said support member, said recesses being adapted to respectively overlie the longitudinal margin portions of the superposed sheet elements from a lateral point intermediate the longitudinal edge on the surface of the second element and the lateral edge defining the exposure area on the surface of the first element and extending inwardly to a lateral point at least coextensive with the lateral edge defining the exposure area on the surface of the first element as the sheet elements are advanced between said first and second members, and a layer of relatively high-friction resilient material located in overlying relation to said support member, said layer including an external surface defining a second sheet-contacting surface and an interior surface having a configuration similar to that of said support member; said second sheet-contacting surface of said second member being capable of relatively more surface deformation on those portions of the said second surface overlying said recesses whereby the inwardly extending lateral edges of the binding means on the surface of the first element may move toward said recesses during spreading of the processing fluid.

3,871,011
EXPOSURE CORRECTION INDICATOR

Katsuhiko Nomura; Hiroshi Kurei, and Fumio Urano, all of Saitama-ken, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Mar. 20, 1974, Ser. No. 452,971
Claims priority, application Japan, Mar. 26, 1973, 48-35422
Int. Cl. G03b 7/00, 17/20
U.S. Cl. 354—152 2 Claims



1. In a single lens reflex camera having a viewfinder, a lens diaphragm ring, and a through-the-lens automatic exposure control system arranged to be operated manually and externally of the camera to memorize at least the electric quantities corresponding to the luminance of a photographic subject and to the diaphragm aperture, the combination comprising

an indicating device viewable through the viewfinder, the indicating device including a rotatable indicator element for rotation from a normal position into a position indicative of a degree of manually selected exposure correction; biasing means for urging the rotatable element in the direction of rotation toward the normal position;

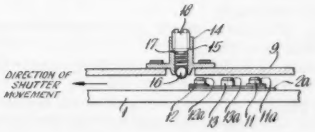
a manual memory operation lever rotatable between a manual memory position and a release position; and

means, including a clutch mechanism, for selectively connecting the diaphragm ring to the rotatable indicator element, the clutch mechanism being operated in response to the manual memory operation lever such that the diaphragm ring and the rotatable indicator element are connected or disconnected in accordance with whether the manual memory operation lever is in the manual memory position or in the released position respectively, and wherein rotation of the diaphragm ring causes rotation of the rotatable indicator element owing to the connection effected therebetween by the clutch mechanism when the manual operation lever is in the manual memory position.

3,871,012
REBOUNDLESS FOCAL PLANE SHUTTER

Keisuke Haraguchi, Kamifukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 14, 1973, Ser. No. 388,294
Claims priority, application Japan, Aug. 30, 1972, 47-100384
Int. Cl. G03b 9/20
U.S. Cl. 354—246 8 Claims



1. A camera shutter comprising a metal blade type shutter member moveable between a charged and discharged position

and a damping means including a click member moveable with said shutter member and having a recess in a face thereof and a detent member located in the path of said click member and resiliently urged into releasable engagement with said recess when said shutter member is in its discharged position to releasably retain said click member in the shutter discharged position, but permitting the movement thereof along said path to opposite sides of said detent member.

3,871,013

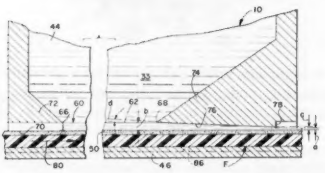
PROCESSOR FOR PHOTOGRAPHIC FILM CASSETTES

Edward F. Burke, Reading, and Douglas B. Holmes, South Natick, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 214,919, Jan. 3, 1972, abandoned. This application May 16, 1973, Ser. No. 360,678

Int. Cl. G03d *3/00*

U.S. Cl. 354—317 **7 Claims**



1. A device for applying processing fluid to the emulsion surface of a photographic film strip having a pair of spaced parallel side rails extending lengthwise along the longitudinal margins of the other surface of such film strip, the device also containing a processor operative to deposit processing fluid on the emulsion surface of a moving run of the film strip after exposure of its emulsion, the improvement comprising:

means defining a nozzle opening in a given plane;

means, including a pressure pad located in spaced relation to such nozzle opening, for supporting at least a portion of such film intermediate such rails in a plane substantially parallel to the plane of said nozzle opening; and

means for providing a positive pressure in such fluid downstream from said nozzle opening in the direction of film travel so as to facilitate uniform distribution of such fluid laterally of such emulsion and to urge such film towards said supporting pressure pad during the application of such fluid.

3,871,014

FLIP CHIP MODULE WITH NON-UNIFORM SOLDER WETTABLE AREAS ON THE SUBSTRATE

William J. King, Poughkeepsie, and David L. Wilcox, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1969, Ser. No. 850,093

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—67 **8 Claims**

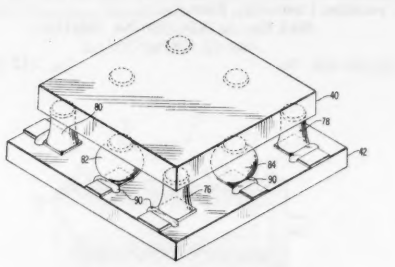
1. In a semiconductor module formed of a chip mounted to a substrate each having first and second major surfaces the improvement comprising

a plurality of solder wettable metal regions on the first major face of said chip,

a first plurality of solder wettable metal regions of a first size on the first major face of said substrate,

a second plurality of solder wettable metal regions of another size substantially different from the first size on said first major face of said substrate, and

plural stress resistant solder means for connecting respective ones of the metal regions on said chip and substrate, whereby said connection means have a first stress resistivity or a second stress resistivity different from the first dependent on whether connection is made to one of said



first or second pluralities of wettable regions on said substrate.

3,871,015

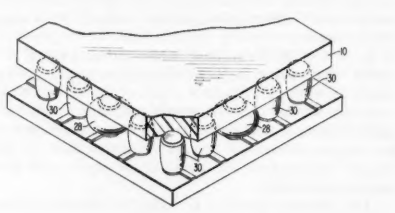
FLIP CHIP MODULE WITH NON-UNIFORM CONNECTOR JOINTS

Paul T. C. Lin, Beacon, N.Y., and Edwin M. Winter, West Los Angeles, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1969, Ser. No. 850,094

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—67 **20 Claims**



1. A semiconductor module comprising a chip having first and second major surfaces with areas of metal on the first major surface thereof, a substrate having first and second major surfaces with areas of metal on the first major surface thereof, said chip and substrate being positioned so that the first major surfaces are face to face, and interconnecting joints mechanically connecting and spacing said surfaces, each of said joints being formed of an agglomeration of geometrical shape and material substance with at least two of said interconnecting joints having unequal agglomerations, whereby the stress resistivities for said unequal agglomerations are unequal.

3,871,016

REFLECTIVE COATED CONTACT FOR SEMICONDUCTOR LIGHT CONVERSION ELEMENTS

John R. Debesis, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

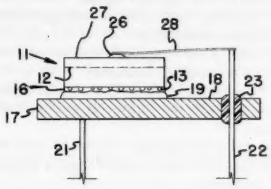
Filed Dec. 26, 1973, Ser. No. 427,936

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—68 **6 Claims**

1. A contact construction for attaching a solid state light conversion element to a conductor member, comprising a plurality of individual electrical contact areas distributed over and attached to a surface of said light conversion element, a

layer of reflective material disposed over and in contact with said surface, and bonding means electrically bonding said

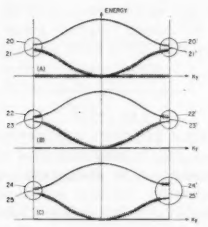


reflective layer and any exposed contact areas to a surface of said conductor member.

3,871,017
HIGH-FREQUENCY PHONON GENERATING APPARATUS AND METHOD

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 54,459, July 13, 1970, Pat. No. 3,676,795, which is a continuation-in-part of Ser. No. 684,155, Nov. 20, 1967, abandoned. This application June 27, 1972, Ser. No. 266,757
Int. Cl. H01s *4/00*
U.S. Cl. 357—26 **13 Claims**

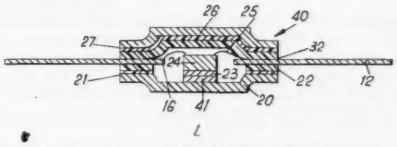


8. Apparatus for generating phonons, that comprises, a multi-valley semiconductor, that is, a semiconductor whose band extrema are not at $k=0$, where k is vector pseudomomentum, so that degenerate valleys result from symmetry, said semiconductor having a conduction band of electron energy levels and a valence band of electron energy levels, said conduction band including unfilled levels and said valence band including filled levels in a condition of thermal equilibrium, means for establishing an inverted population in the occupation of the electronic energy levels of the valence and conduction bands of the semiconductor by supplying energy to move electrons from filled levels in said valence band to unfilled levels in said conduction band, means for maintaining the lattice temperature of the semiconductor at a value low enough to enable the semiconductor material to sustain at least two separate inverted electron populations in energy level band valleys having different values of vector psuedomomentum k, and means for applying a stress to the semiconductor, the stress being one that lifts the multi-valley degeneracy and of sufficient strength that intervalley electronic transitions combined with the generation of corresponding momentum conserving phonons take place.

3,871,018
CONSTRUCTION OF PACKAGES FOR SEMICONDUCTOR DEVICES

Sydney Jackson, Hayfield, and Joseph Bell Titterington, Burnley, both of England, assignors to Ferranti Limited, Hollinwood, England

Continuation of Ser. No. 236,324, March 20, 1972, abandoned. This application July 9, 1973, Ser. No. 377,177
Claims priority, application Great Britain, Mar. 26, 1971, 8720/71; May 1, 1971, 12599/71
Int. Cl. H01l *1/10*
U.S. Cl. 357—74 **7 Claims**



1. A package construction for a semiconductor device including a sub-assembly unit having a metal support to which the semiconductor device is bonded, conductors initially comprising a lead frame, and selectively on peripheral parts of the support a first composite glass layer having a composite composition comprising a first glass base layer with an affinity for the material of the support, and on said first glass base layer securing said conductors onto said support a first glass coating with a melting point below that of said first glass base layer whereby a minimum thickness of said first glass base layer insulates said conductors from said support, said package construction also including, to seal a semiconductor device bonded to said support within said package, a metal capping member secured to said sub-assembly unit, on said capping member a second composite glass layer having a composite composition comprising a second glass base layer with an affinity for the material of said capping member, and on at least part of said second glass base layer of said second composite layer a second, adhesive coating of glass having a melting point lower than the melting point of said first glass coating of said first composite layer and lower than said second glass base layer of said second composite layer so as to maintain the accurate alignment of said conductors embedded in said first glass coating with respect to said semiconductor device and to prevent damage to said semiconductor device, when so secured said conductors being insulated from said capping member, and said support said capping member and said first composite glass layer on said support having co-efficients of linear expansion substantially the same.

3,871,019
LINE SEQUENTIAL COLOR TELEVISION RECORDING SYSTEM

Joseph Peter Bingham, Birchwood Ct., N.J., assignor to RCA Corporation, New York, N.Y.

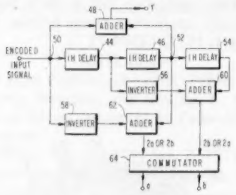
Filed Apr. 13, 1973, Ser. No. 350,899
Claims priority, application Great Britain, Apr. 19, 1972, 18155/72
Int. Cl. H04n *9/02*
U.S. Cl. 358—4 **27 Claims**

1. A line sequential encoder for a color television recording system, comprising:

a. input means supplying a set of color signals representative of a color image scanned in a series of lines;

b. an encoding matrix coupled to the input means for deriving therefrom a luminance signal comprising components whose frequencies lie primarily at integral multiples of the horizontal line scanning frequency and a plurality of color difference signals comprising components whose frequencies lie primarily at integral multiples of the horizontal line scanning frequency;

c. switching means synchronized with the horizontal line scanning frequency for sequentially coupling each one of the plurality of color difference signals to an output terminal in a cyclic, repetitive manner to develop a chrominance signal at said output terminal comprising components whose frequencies lie primarily at spectral locations



intervening integral multiples of the line scanning frequency; and

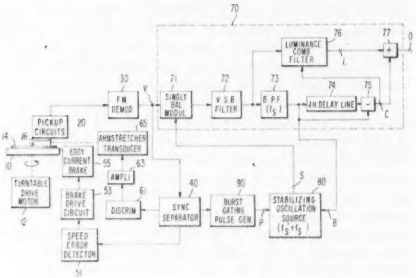
d. adding means, responsive to the luminance signal derived by said matrix and to the chrominance signal developed at said switching means output terminal, for combining said luminance and chrominance signals to provide a composite output signal for recordation.

3,871,020

CHROMINANCE SIGNAL CORRECTION

James Albert Wilber, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,564
Int. Cl. H04n *9/02, 5/76*
U.S. Cl. 358—8 **8 Claims**



1. In a video disc player including (a) video disc playback apparatus for developing a composite color television signal including a chrominance signal component occupying a first band of frequencies and comprising sidebands of a color subcarrier at a nominal frequency of f_s' and an accompanying color synchronizing component comprising recurring bursts of oscillations at said nominal frequency of f_s' said components however being subject to spurious frequency variations; and (b) means for deriving from said developed composite color television signal a chrominance signal component occupying a second band of frequencies, separate from and higher than said first band, and comprising sidebands of a color subcarrier at a nominal frequency of f_s and an accompanying color synchronizing component comprising recurring bursts of oscillations at said nominal frequency of f_s' said deriving means including a modulator responsive to the composite signal developed by said playback apparatus and to additional oscillations; apparatus for rendering the frequencies of said derived signal components substantially independent of said spurious frequency variations, comprising the combination of:

a crystal controlled oscillator operating at the frequency f_x;

a voltage controlled oscillator having a nominal operating frequency appreciably less than either f_s or f_s', but subject to variation within a third frequency band, separate from and lower than said first band, in accordance with a control voltage input;

phase detector means responsive to the output of said crystal controlled oscillator and to the color synchronizing component of said derived signal;

means for deriving said control voltage input from said phase detector means;

means for effectively frequency multiplying the output of said crystal controlled oscillator;

means for heterodyning the output of said frequency multiplying means with the output of said voltage controlled oscillator;

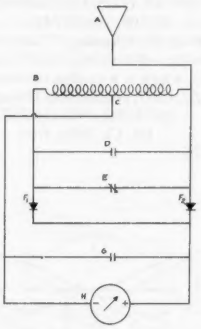
and means for utilizing the output of said heterodyning means as said additional oscillations to which said modulator is responsive.

3,871,021

3.58 MEGACYCLE BANDPASS AND OSCILLATOR DETECTOR FOR A COLOR TELEVISION

Clennie Cecil Brooks, 412 Edgewood Ave., Rome, Ga. 30161

Filed June 15, 1973, Ser. No. 353,309
Int. Cl. H04n *9/62*
U.S. Cl. 358—10 **1 Claim**



1. An apparatus for testing in a color television receiver which apparatus requires no power supply comprising:

a sensing means for radiated waves, a resonant circuit means comprising an inductance means and capacitance means connected to said sensing means, a rectifiying means connected to the resonant circuit, a metering means connecting the rectifying means and inductance means, said apparatus senses the operability of a color oscillator in said receiver when said sensing means is closely associated with said oscillator,

said sensing means comprising a loop connected to said resonant circuit.

3,871,022

NOISE AND OVERLOAD PROTECTION CIRCUIT FOR SYNCHRONOUS DEMODULATORS

Milton E. Wilcox, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 3, 1973, Ser. No. 421,291
Int. Cl. H04n *9/50*
U.S. Cl. 358—23 **12 Claims**

6. A demodulator circuit suitable for being manufactured in integrated circuit form and for operating at low power supply voltages including in combination:

synchronous demodulator means having an input terminal adapted to receive a modulated input signal and an output terminal at which a demodulated output signal is developed, said synchronous demodulator means tending to provide an output signal of undesired magnitude in

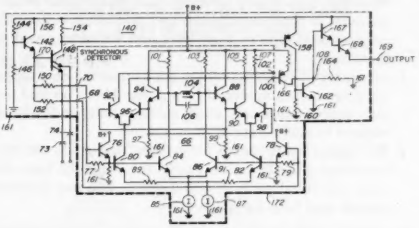
response to the magnitude of the input signal exceeding a first threshold level;

first conductor means adapted to supply a first power supply voltage of a first magnitude;

second conductor means;

voltage reference supply means connected between said first conductor means and said second conductor means, said voltage reference supply means providing a reference voltage at an output terminal thereof;

first electron control means having a first electrode, a second electrode connected to said output terminal of said voltage reference means and a third electrode;



first circuit means connecting said first electrode and said second electrode of said first electron control means to said input terminal of said synchronous demodulator means, said first electron control means being rendered conductive in response to the input signal exceeding a second threshold level which is less than said first threshold level; and

second circuit means coupled between said third electrode of said first electron control means and said output terminal of said synchronous demodulator means, said second circuit means being responsive to said first electron control means being rendered conductive to provide a desired output signal level at the output terminal of said synchronous demodulator means.

3,871,023

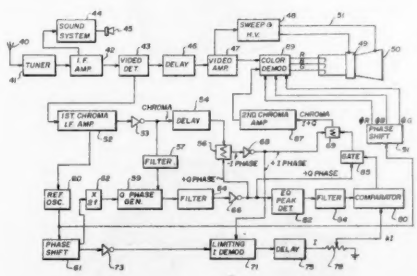
LIMITING DETECTOR CIRCUIT AND METHOD OF OPERATING SAME

Gerald L. Caprio, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 248,195, April 27, 1972, abandoned. This application June 20, 1974, Ser. No. 481,297

Int. Cl. H04n *9/535*

U.S. Cl. 358—28 **5 Claims**



1. A product detector having first and second inputs including in combination:

means for supplying an amplitude modulated input signal at a predetermined frequency to the first input of said product detector, the amplitude modulations of said input signal being subject to exceeding a predetermined amplitude; and

means for supplying a reference signal at said predetermined frequency, and having an amplitude less than said predetermined amlitude, to the second input of said product detector.

3,871,024

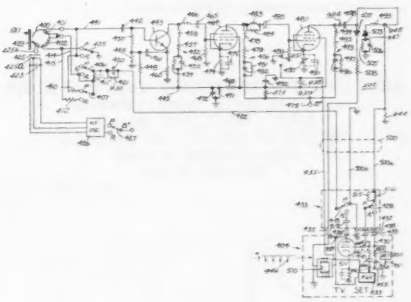
VIDEO TRANSDUCER SYSTEM WITH MAGNETIC TRANSDUCER HEAD HAVING OUTPUT WINDING MEANS RESONANT AT A MID BAND RESONANCE FREQUENCY

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 165,660, July 23, 1971, abandoned, and a continuation-in-part of Ser. Nos. 344,075, Feb. 11, 1964, and Ser. No. 848,992, Aug. 11. 1969, which is a division of Ser. No. 401,832, Oct. 6, 1964, Pat. No. 3,495,046, which is a continuation-in-part of Ser. No. 389,021, Aug. 12, 1964, Pat. No. 3,469,037. This application June 15, 1973, Ser. No. 370,534

Int. Cl. H04n *5/78*; **G11b** *5/20, 5/44*

U.S. Cl. 360—33 **17 Claims**



1. A video transducer system for the transmission of video intelligence comprising: a magnetic transducer head having output winding means resonant at a mid band resonance frequency, said head having coupling means for coupling to a magnetic record medium to receive input frequency components both above and below said mid band resonance frequency and producing at the output winding means corresponding output frequency components having a substantial phase error therebetween in comparison to the relative phase of said input frequency components the input frequency components extending frequency component to the highest essential frequency component for transmission of the video intelligence extnding over many octaves, and signal translating means having an input coupled to said output winding means and having an input impedance at said mid band resonance frequency, said signal translating means having an output, and having a compensating circuit interposed between the input and output thereof to substantially equalize the shifts in phase produced between said head coupling means and said output over a substantial range of frequencies including frequency components below said mid band resonance frequency and frequency components above said mid band resonance frequency to essentailly compensate for such phase error over the wide bandwidth of the video intelligence being transmitted.

3,871,025

TAPE LOADING SYSTEM FOR AUTOMATICALLY WITHDRAWING A TAPE FROM A CASSETTE AND ENGAGING THE TAPE WITH A RECORDING AND/OR REPRODUCING HEAD

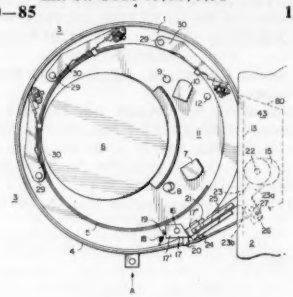
Soji Nakamoto, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 25, 1973, Ser. No. 363,844

Claims priority, application Japan, June 1, 1972, 47-54836

Int. Cl. G11b *15/66, 5/52*

U.S. Cl. 360—85 **12 Claims**



1. An automatic magnetic tape loading system for magnetic recording and/or reproducing apparatus comprising,

a. at least one rotating magnetic head;

b. cylindrical tape guide means mounted on a base member for guiding a magnetic tape on its surface said cylindrical tape guide means having a circumferential gap along which said at least one rotary magnetic head scans, as said magnetic tape moves along said tape guide means crossing said gap;

c. a rotatable loop means surrounding said cylindrical tape guide means in an eccentric relationship therewith;

d. means for rotating said loop means;

e. pinch roller means rotatably mounted on a first axis means disposed on a first supporting member rotatably carried by a second axis means on a second supporting member mounted on a third axis means mounted on said rotatable loop means whereby said pinch roller means is movable in three dimensions and said pinch roller means engages said tape in a cassette and withdraws said tape therefrom;

f. a plurality of guide pin means each mounted on a supporting plate means mounted by a pillow block on said rotatable loop means and each moving independently with respect to said rotatable loop means;

g. first guide frame means for guiding said guide pin means such that said pin means guides the magnetic tape along said cylindrical guide means crossing said gap upon rotation of said loop means; and

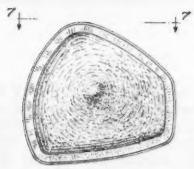
h. second guide frame means for guiding said pinch roller means such that said pinch roller draws the magnetic tape out of the cassette and moves it along said cylindrical guide means upon rotation of said loop means.

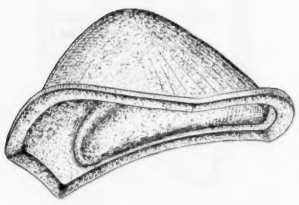
DESIGNS

GRANTED MARCH 11, 1975

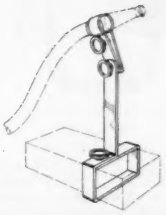
234,444
BRASSIERE
Irwin Greenblatt, Blauvelt, N.Y., and Nicholas A. Marino, Chicago, Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.
Filed Oct. 31, 1972, Ser. No. 302,592
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

234,445
BRASSIERE PAD
Irwin Greenblatt, Blauvelt, N.Y., and Nicholas A. Marino, Chicago, Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.
Filed Oct. 31, 1972, Ser. No. 302,593
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

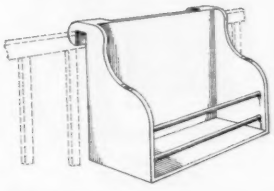




234,446
SUPPORT BRACKET FOR HOSE NOZZLE
Nelson Severinghaus, Atlanta, Ga.
(213 Glenn Circle, Decatur, Ga. 30030)
Filed Feb. 22, 1973, Ser. No. 334,912
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—112



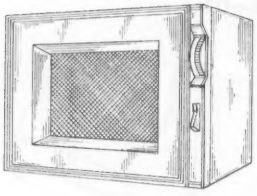
234,447
RACK FOR CRIB ACCESSORIES OR THE LIKE
Kenneth E. Johns, 22909 Baltar St., Canoga Park, Calif. 91304
Filed July 30, 1973, Ser. No. 383,585
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113



234,448
GOBLET OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 9, 1973, Ser. No. 377,595
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

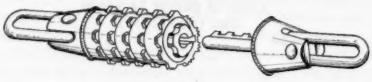
234,449
COFFEEMAKER
Franz Alban Stuetzer, Muhlheim am Main, and Klaus Mayer, Offenbach am Main, Germany, assignors to Rowenta-Werke G.m.b.H., Offenbach am Main, Germany
Filed Aug. 13, 1973, Ser. No. 388,501
Claims priority, application Germany Feb. 16, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62

234,450
ELECTRONIC COOKING RANGE
Yoshio Suganoya and Takao Miyake, Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed June 20, 1973, Ser. No. 371,774
Claims priority, application Japan Dec. 26, 1972
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



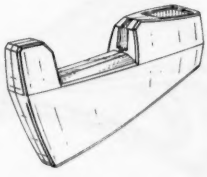
234,451
GAS METER VALVE WRENCH
Joseph C. Bloom, 1815 Guerneville Road, Santa Rosa, Calif. 95406
Filed Sept. 19, 1973, Ser. No. 398,824
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—17

234,452
COMBINATION LOCK FOR BICYCLES OR THE LIKE
Hisashi Saito, Nagoya, Japan, assignor to Kabushiki Kaisha Saikosha Seisakusho, Kasugai, Aichi Perfecture, Japan
Filed Jan. 3, 1973, Ser. No. 320,711
Term of patent 14 years
The term of this patent subsequent to Aug. 10, 1985, has been disclaimed
Int. Cl. D8—*07*
U.S. Cl. D8—114

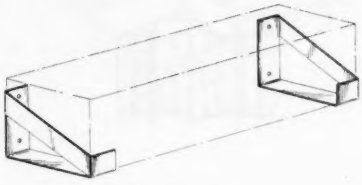


234,453
BATTERY POWERED TAPE WINDER FOR PUNCHED PAPER TAPE AND THE LIKE
Jacob J. Ginsberg, Tewksbury, Mass., assignor to Peripheral Graphics Inc., Andover, Mass.
Filed July 12, 1973, Ser. No. 378,615
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220

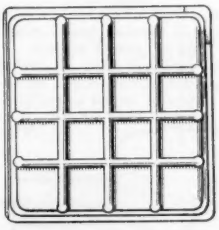
234,454
COVER FOR AUTOMOBILE SEAT BELT LOCK
Ulf Tolfsen, Fredrikstad, Norway, assignor to Loyd's Industri A/S, Fredrikstad, Norway
Filed Oct. 15, 1973, Ser. No. 406,400
Claims priority, application Norway Apr. 13, 1973
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D8—224



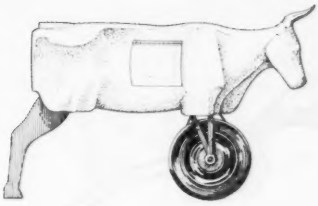
234,455
SET OF BRACKETS FOR PAPER TOWEL PACKAGES OR THE LIKE
William A. Blake, 8757 NE. Prescott St., Portland, Oreg. 97220
Filed Jan. 28, 1974, Ser. No. 436,992
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233



234,456
CONTAINER FOR FOOD PRODUCTS
Timothy E. Dearth and Richard H. Guernsey, Indianapolis, and Ronald R. Hydell, Speedway, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Mar. 19, 1973, Ser. No. 342,648
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



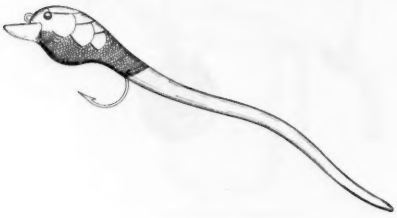
234,457
MECHANICAL ROPING STEER
Ralph Mosa, 3336 Mustang, Las Vegas, Nev. 89108
Filed Dec. 26, 1973, Ser. No. 428,038
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



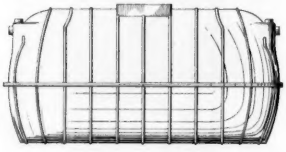
234,458
HAND GUN
Philip R. Lichtman, 35 Lee St., Cambridge, Mass. 02173
Filed Nov. 5, 1973, Ser. No. 412,727
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

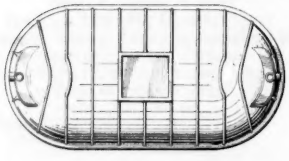
234,459
HAND GUN
Philip R. Lichtman, 35 Lee St., Cambridge, Mass. 02173
Filed Nov. 12, 1973, Ser. No. 414,902
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

234,460
FISHING LURE
Russell F. Caldwell, 1116 8th Ave., Silvis, Ill. 61282, and Dannie E. Laughead, 1830 31st St., Moline, Ill. 61265
Filed Jan. 28, 1974, Ser. No. 437,178
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

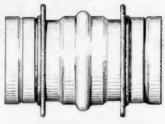


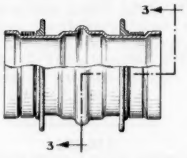
234,461
SEWAGE SEPTIC TANK
Terrell D. Piotrowski, 103 Pamela Drive, Athens, Ga. 30601
Filed Apr. 10, 1973, Ser. No. 349,822
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



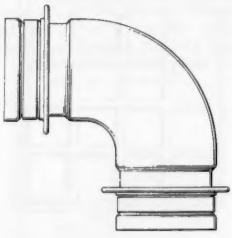


234,462
DUCT COUPLING
Ake Ahlrot, Amiralsgatan 10, S–552 48 Jonkoping, Sweden
Continuation-in-part of design application Ser. No. 279,067, Aug. 9, 1972. This application Nov. 17, 1972, Ser. No. 307,365
Claims priority, application Sweden Feb. 11, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43

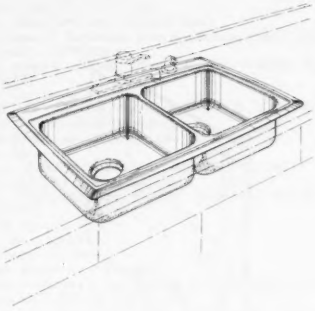




234,463
DUCT COUPLING
Ake Ahlrot, Amiralsgatan 10, S–552 48 Jonkoping, Sweden
Continuation-in-part of design application Ser. No. 307,365, Nov. 17, 1972, which is a continuation-in-part of abandoned design application Ser. No. 279,067, Aug. 9, 1972. This application Feb. 22, 1974, Ser. No. 444,882
Claims priority, application Sweden Feb. 11, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



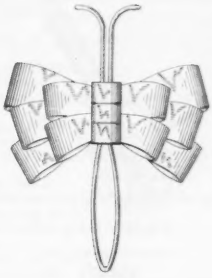
234,464
DOUBLE BOWL SINK
Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Aug. 2, 1973, Ser. No. 385,116
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—62



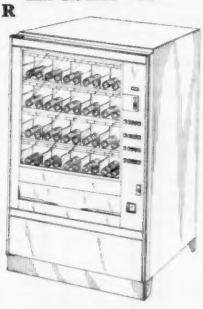
234,465
INCENSE BURNER
Louis C. Warner, 205 Summit E., Apt. 302, Seattle, Wash. 98102
Filed May 13, 1974, Ser. No. 469,379
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D23—78

234,466
ELECTRONIC CALCULATING MACHINE
Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 26, 1973, Ser. No. 409,871
Claims priority, application Japan Apr. 28, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

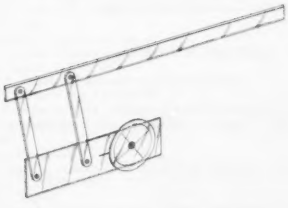
234,467
BUTTERFLY BOW DECORATION
Elaine V. Del Grosso, 318 Greenway Drive, Pittsburgh, Pa. 15235
Filed Nov. 17, 1971, Ser. No. 199,831
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D29—1 R



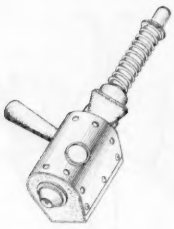
234,468
VENDING MACHINE
Walter L. Koch, Caldwell, and Robert P. Franklin, Jefferson Township, N.J., assignors to Rowe International Inc., Whippany, N.J.
Filed May 3, 1973, Ser. No. 356,766
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R



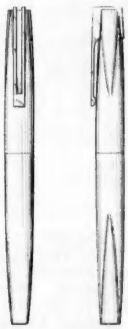
234,469
NAVIGATION INSTRUMENT
John Lindsay, 5050 NE. 178th St., Seattle, Wash. 98155
Filed Dec. 4, 1972, Ser. No. 311,794
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—62



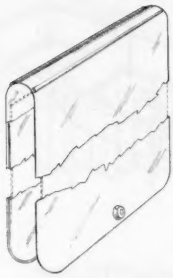
234,470
PLASTICS INJECTION MOLDER
Robert M. Haygeman, Box 11, Canton, S. Dak. 57013
Filed May 3, 1973, Ser. No. 356,744
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 F



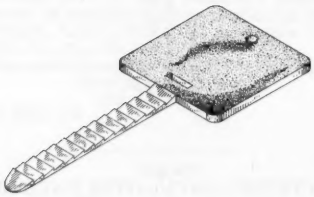
234,471
PEN
Alain Carre, Paris, France, assignor to Societe Le Foyer, Paris, France
Continuation-in-part of abandoned design applications Ser. No. 227,323 and 227,325, both Feb. 17, 1972. This application June 1, 1973, Ser. No. 366,210
Claims priority, application France Aug. 18, 1971
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51



234,472
ADVERTISING INSERT HOLDER FOR SUPERMARKET CARTS
Donald H. Fosher, 352 Diplomat Lane, Chesterfield, Mo. 63017, and Robert J. Brace, 9415 Crestwood Manor Drive, St. Louis, Mo. 63126
Filed May 17, 1973, Ser. No. 361,251
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—3



234,473
IDENTIFICATION TAG
James B. Ringle, Rte. 5, Box 544, Angola, Ind. 46703
Filed Feb. 20, 1974, Ser. No. 444,031
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D19—18



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MARCH, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Weber & Co., Inc.: *See—*
Shepherd, Don W., 3,870,386.

A. E. Staley Manufacturing Company: *See—*
Hayes, Lester P.; Robinson, John W.; Simms, Ross P.; and Russell, Millard E., 3,870,805.
Kryger, Allen C.; Nevin, Charles S.; and Wilhelm, Donald L., 3,870,527.

A. J. Oster, Co.: *See—*
Darnell, Robert S.; and Morrissey, Everett G., 3,870,513.

A/S Raufoss Ammunisjonsfabrikker: *See—*
Kleppe, Byrge; and Torgersen, Ole, 3,870,081.

A-T-O Inc.: *See—*
Mathews, Carl S.; and Swagerty, Arnold, 3,870,999.

A-1010, by said Erna Plasser, heir: *See—*
Plasser, Franz, deceased; Theurer, Josef; and Schubert, Egon, 3,869,907.

AB Filtrator: *See—*
Ritzler, Bo, 3,870,483.

Abbott Laboratories: *See—*
Johnson, Wayne R., 3,870,872.

Abe, Takeshi, to Ricoh Co. Ltd. Storage device for information recording sheets. 3,870,409, Cl. 353-27.000.

Abe, Takeshi, to Ricoh Co., Ltd. Mark reader. 3,870,410, Cl. 353-26.000.

Abel, Donald J., to Meto Corporation. Electromagnetic instrument tapping device. 3,870,103, Cl. 173-100.000.

Abels, Theodor; and Puschel, Siegfried, to Linde Aktiengesellschaft. Vehicle drive with two electric motors. 3,870,935, Cl. 318-52.000.

Abu El-Haj, Marwan J., to Pfizer Inc. 2-Imidazolidine substituted quinoxaline-1,4-dioxides and intermediates therefor. 3,870,718, Cl. 260-250.00Q.

Aceto Chemical Co., Inc.: *See—*
Mann, Seymour, 3,870,550.

Acheson Industries, Inc.: *See—*
Wiley, Robert Emerson; and Coniglio, James John, 3,870,987.

Acme-Cleveland Corporation: *See—*
Holt, Frederick R.; and Flueckiger, Noah, 3,870,948.

Acuity Systems, Incorporated: *See—*
Cornsweet, Tom N., 3,870,415.

Adam, Fritz Gunter; and Renz, Albrecht, to ITT Industries, Inc. Semiconductor component and its method of manufacturing. 3,869,786, Cl. 29-571.000.

Adams, John William; Babaa, Ihsan Mustafa Hasan; and Hester, Donald Larry, to Bell Telephone Laboratories Incorporated. Telephone ringer counter. 3,870,837, Cl. 179-175.20B.

Adams, Joseph W.: *See—*
Patrick, Malcolm W.; and Adams, Joseph W., 3,870,052.

Adamski, Joseph A.; Weiner, Joseph R.; and Lavoie, Girard H. Method and apparatus for growing crystals by annealing the crystal after formation. 3,870,472, Cl. 23-273.0SP.

Addressograph Multigraph Corporation: *See—*
Goebel, Joseph, 3,870,413.
Patzke, Robert C.; and Goebel, Joseph, 3,870,981.
Toth, Thomas Daniel, 3,869,984.

Admiral Corporation: *See—*
Wolff, Robert A., 3,870,956.

Aetna Business Credit, Inc.: *See—*
Perri, Joseph, 3,870,273.

Aetna-Standard Engineering Company: *See—*
Dolle, David E., 3,869,949.
Rau, Robert J., 3,869,948.

Afanasiev, Viktor Vasilievich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Afflerbach, Frank D.; Barnett, Irvin; and Peters, Walter B., to Johns-Manville Corporation. Friction element and method of making same. 3,870,581, Cl. 156-192.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Jores, Willi; Hoffacker, Franz; and Lehmann, Helmut, 3,870,584.
Moisar, Erik; and Klotzer, Sieghart, 3,870,522.

Ahern, James E.: *See—*
Gayler, Winston D.; and Ahern, James E., 3,870,823.

Ahrens, Barry Louis, to Deere & Company. Interlocked hand-and foot-operable engine speed control. 3,869,937, Cl. 74-482.000.

Aignesberger, Alois; Kriele, Ulrich; and Michaud, Horst, to Suddeutsche Kalkstickstoff-Werke AG. Method for dispersing. 3,870,671, Cl. 260-29.40R.

Aihara, Satoshi: *See—*
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Aihara, Satoshi, 3,870,558.

All Systems: *See—*
Hanna, Drexel W., Jr., 3,870,992.

Air-Industrie: *See—*
Lacchia, Adrien, 3,870,232.

Air Products and Chemicals Inc.: *See—*
DeLaMater, George B.; Herrick, Elbert C.; and Milligan, Barton, 3,870,739.
Kaplan, Paul N., 3,870,152.

Air Purification Systems, Inc.: *See—*
Dixson, Bruce E.; Hoffman, Marcus I., III; and Walls, Milton A., 3,870,495.

Aisin Seiki Co. Ltd.: *See—*
Miyao, Takayuki; and Maeda, Hiroaki, 3,869,939.

Aktiebolaget Atomenergi: *See—*
Margen, Peter Heinrich Erwin, 3,869,857.

Aktiebolaget Bofars: *See—*
Andersson, John Erik, 3,869,906.

Aktiebolaget Electrolux: *See—*
Eriksson, Bolik Anders Gottfrid; Johansson, Erik Karl Gustav; and Vukotic, Milos, 3,870,486.

Aktieselskabet Chr. Nielsens Eftf.: *See—*
Broe, Max, 3,870,274.

Albaum, Joseph D.: *See—*
Capossela, Anthony C.; McGuire, Michael T.; Smith, Gordon C.; and Albaum, Joseph D., 3,870,806.

Alco Standard Corporation: *See—*
Newell, Stephen D., 3,870,235.

Alcorn, Edward B.: *See—*
Roberts, Robert C; and Alcorn, Edward B., 3,870,825.

Aldrich, Charles S.: *See—*
Canick, Leon N.; and Aldrich, Charles S., 3,870,224.

Aldrich, Robert G., to Syracuse University Research Corp. Chemical comminution of coal and removal of ash including sulfur in inorganic form therefrom. 3,870,237, Cl. 241-1.000.

Alexander, John Bert: *See—*
Barth, Gerald Dean; and Alexander, John Bert, 3,869,957.

Alexander, Wayne K.: *See—*
Dugger, William H.; and Alexander, Wayne K., 3,870,199.

Alexandrova, Angelina Nikolaevna: *See—*
Alexeeva, Alexandra Konstantinovna; Yakovleva, Ljudmila Alexandrovna; Vasilieva, Irina Nikolaevna; Andzhaparidze, Otar Georgievich; and Alexandrova, Angelina Nikolaevna, 3,870,598.

Alexeeva, Alexandra Konstantinovna; Yakovleva, Ljudmila Alexandrovna; Vasjlieva, Irina Nikolaevna; Andzhaparidze, Otar Georgievich; and Alexandrova, Angelina Nikolaevna. Influenzal vaccine for peroral administration and a method of producing same. 3,870,598, Cl. 195-1.500.

Allegheny Plastics, Inc.: *See—*
Shields, John P., 3,870,847.

Allen, Cloy L. Mobile home protector. 3,869,836, Cl. 52-23.000.

Allen, Corey M., to Carton Sales, Inc. Cigarette carton dispensing system. 3,870,135, Cl. 194-4.000.

Allen, John E., to Ferro-Carb Agglomeration Ltd., Inc. Control of pollution by recycling solid particulate steel mill wastes. 3,870,507, Cl. 75-4.000.

Allen, John E., to Ferro-Carb Agglomeration Ltd., Inc. Method of disposing of particulate scrap iron. 3,870,509, Cl. 75-44.00S.

Allen, Marshall T. Apparatus and method for testing engine oil pressure. 3,869,905, Cl. 73-119.00R.

Allen, Melvin O. Voltage monitoring system. 3,870,928, Cl. 317-13.00R.

Allen, Thomas E., to CMI Corporation. Surface finishing method and apparatus. 3,870,427, Cl. 404-103.000.

Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. 6H-S-TRIAZOLO[4,3-a][1,4]BENZODIAZEPIN-6-ONES. 3,870,706, Cl. 260-239.30T.

Allied Chemical Corporation: *See—*
Belsky, Stephen Edward; and Bonfield, John Henry, 3,870,716.
Guptill, Joel P., 3,870,780.

Allied Steel & Tractor Products, Incorporated: *See—*
Century, Bernard A., 3,870,279.

Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D. Shoe merchandizing and handling system. 3,870,153, Cl. 211-37.000.

Allsop, James D.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,870,153.

Allsop, Jon I.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,870,153.

Allsop, Michael G.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,870,153.

Almich, Clarence L.; Polk, Jack D., Jr.; and Aulick, Robert A., to Northrop Corporation. Training module connector. 3,870,839, Cl. 200-5.00A.

Alpert, Seymour B.: *See—*
Johnson, Axel R.; Wolk, Ronald H.; and Alpert, Seymour B., 3,870,623.

Alps Electric Co., Ltd.: *See—*
Suzuki, Kazuo, 3,870,961.

Altimus, William B. Inboard outboard motor cover. 3,870,875, Cl. 240-2.00R.

Aluminum Company of America: *See—*
Hawkins, Ronald G., 3,870,815.
Wentzel, Warren W., Jr.; and Harper, Robert A., Jr., 3,870,374.

Amendola, Warren R. Golf tee holder usable to form a rake. 3,870,300, Cl. 273-32.00B.

American Aero Inc.: *See—*
Stachowiak, John E.; and Goss, John B., 3,870,439.

American Hospital Supply Corporation: *See—*
Aulik, Clarence J., 3,870,289.

American Seating Company: *See—*
Barecki, Chester J., 3,870,363.

Ametek, Inc.: *See—*
Hardiman, Russell J.; Leiter, Leigh David; and Valle, Howard C., 3,870,263.

Ammann, Ernst, to Siemens Aktiengesellschaft. Device for measuring absorption. 3,870,885, Cl. 250-360.000.

Anaconda American Brass Co.: *See—*
Bray, Robert S.; and Tapley, Claude D., 3,869,899.

Anchor Hocking Corporation: *See—*
Brown, William L.; and Shonebarger, Francis J., 3,870,015.

Anderson, Gordon C.: *See—*
Pray, Lester W.; and Anderson, Gordon C., 3,870,195.
Savageau, Richard J.; and Anderson, Gordon C., 3,869,759.

Anderson, Harold Elden; and Kruckenberg, Perry Lester, to McCulloch Corporation. Method and apparatus for improving the fuel injection characteristics of internal combustion engines. 3,870,025, Cl. 123-139.0AF.

Anderson, John D.; and Vander Stel, Gerald L., to Avis Products, Inc. Convertible portable folding greenhouse. 3,869,827, Cl. 47-17.000.

Andersson, John Erik, to Aktiebolaget Bofars. Element applicable as or in a transducer (load cell). 3,869,906, Cl. 73-141.00A.

Andrews, Philip S.: *See—*
Farrissey, William J., Jr.; and Andrews, Philip S., 3,870,677.

Andzhaparidze, Otar Georgievich: *See—*
Alexeeva, Alexandra Konstantinovna; Yakovleva, Ljudmila Alexandrovna; Vasilieva, Irina Nikolaevna; Andzhaparidze, Otar Georgievich; and Alexandrova, Angelina Nikolaevna, 3,870,598.

Anfruns, Luis Sentis. Method and machine for making toe pieces for socks and stockings. 3,869,881, Cl. 66-64.000.

Angstadt, Howard P., to Sun Ventures, Inc. Complex of 2,6-dimethylnaphthalene and 2-cyano-6-methylnaphthalene. 3,870,745, Cl. 260-465.00R.

Anheuser-Busch, Incorporated: *See—*
Teng, James; and Stubits, Marcella C., 3,870,701.

Anthamatten, Joseph L. Brake and multi-speed drive for a bicycle. 3,870,134, Cl. 192-6.00A.

Antipin, Vadim Grigorievich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.

Anzel, Sanford H.: *See—*
Waugh, Theodore R.; Smith, Richard C.; Anzel, Sanford H.; and Orofino, Caesar F., 3,869,731.

Aoki, Toshio: *See—*
Suzuki, Tomohide; and Aoki, Toshio, 3,870,820.

Appleman, William S.: *See—*
Richmond, Albert R.; and Appleman, William S., 3,870,110.

Applied Power Industries, Inc.: *See—*
Hunnicutt, Wayne E.; and Rossbach, Peter G., 3,869,767.

Apt, Jerome, Jr.; Wachter, William J.; and Rohrer, Wesley M., Jr., to USC Incorporated. Sampling slide value. 3,870,078, Cl. 137-625.480.

Aqua Media: *See—*
Faylor, Terry Lee; and Martin, Roger W., 3,870,033.

Arakawa, Yasuhiro: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Arakelian, Hagop; and Wright, Jeffrey L., to J. W. Microelectronics Corporation. Coordination testing system. 3,869,812, Cl. 35-22.00R.

Aralt, Per Tybring, to Kristian Gerhard Jebsen. Assembly for preventing the escape of dust particles during a more or less flowing transfer of powdered material. 3,870,168, Cl. 214-17.000.

Arblaster, Dennis. One-piece seamless hollow resuscitation plaque. 3,870,038, Cl. 128-28.000.

Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, to John Wyeth & Brother Limited. 4-Alkanoylamino isoquinoline diones and 3-alkanoyloxy-4-alkanoylamino isoquinolones. 3,870,721, Cl. 260-281.000.

Ardeleanu, Stefan P.: *See—*
Teodorescu, Constantin Gh.; and Ardeleanu, Stefan P., 3,870,250.

Arendt, Hans F.: *See—*
Rotter, Erhard F., 3,869,883.

Arikawa, Yoshijiro: *See—*
Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, 3,870,603.

Arledter, Hanns F.; and Marek, Josef, to Austria Tabakwerke Aktiengesellschaft vorm. Method of making a laminated tobacco foil. 3,870,054, Cl. 131-140.00C.

Armstrong Cork Company: *See—*
Witman, Jack H., 3,870,591.

Arndt, Frederick W.; and Gavin, Joseph H., to Dart Industries Inc. Liquid eliminator. 3,870,488, Cl. 55-440.000.

Arnold, Carter H. Load brake. 3,870,129, Cl. 188-134.000.

Arnold, George T.; Hochman, Jack M.; and Pennington, Robert E., to Exxon Research and Engineering Company. Residuum processing. 3,870,621, Cl. 208-8.000.

Arthur D. Little, Inc.: *See—*
Fougere, Guy L., 3,870,137.

Asadea, Takashi; and Okamoto, Shin, to Tachikawa Research Institute. Process for the preparation of dispersion water for incompletely regenerated cellulose substance. 3,870,596, Cl. 162-157.00C.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Tanaka, Kyugo; Oshima, Shozo; and Watanabe, Itaru, 3,870,760.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Haraguchi, Keisuke, 3,871,012.
Nomura, Katsuhiko; Kurei, Hiroshi; and Urano, Fumio, 3,871,011.
Takahashi, Yasuo; and Okudaira, Sadao, 3,870,402.

Asaoka, Masayuki: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Ashton, William B.; Gonzalez, Luis A.; Nelson, Gerald V.; and Mead, Theodore C., to Texaco Inc. Hydrogenation of a hydrocracked lubricating oil. 3,870,622, Cl. 208-93.000.

Asplund, Alf Ake, to Industrikompaniet. Device for dispensing of a paste product. 3,870,201, Cl. 222-207.000.

Associated Electric Industries: *See—*
Halliday, John Stephen; and Green, Brian Noel, 3,870,881.

Astafiev, Anatoly Alexandrovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Atlantic Richfield Company: *See—*
Loncaric, Rado G., 3,870,350.

Atlas Pacific Engineering Company: *See—*
Ellis, Robert G., 3,869,974.

Attenborough, Christopher George, to National Research Development Corporation. Bone joint prosthesis. 3,869,729, Cl. 3-1.000.

Attridge, Russell G., Jr., to Ranco Incorporated. Comfort temperature control system for a zone. 3,870,227, Cl. 236-49.000.

Atwater, William M., to Harriss-Conners Chevrolet, Inc. Drill-operated abrading tool. 3,869,832, Cl. 51-170.0PT.

Atwood Vacuum Machine Company: *See—*
Krause, Herbert, 3,870,361.

August Bilstein, Firma: *See—*
Willich, Jean Herbert, 3,870,286.

Aulick, Robert A.: *See—*
Almich, Clarence L.; Polk, Jack D., Jr.; and Aulick, Robert A., 3,870,839.

Aulik, Clarence J., to American Hospital Supply Corporation. Back support mechanism for medical examination table. 3,870,289, Cl. 269-324.000.

Austin, George E.; and Kalyan, Jagdish C., to Compressed Air Products Inc. Air motor. 3,869,962, Cl. 91-46.000.

Austria Tabakwerke Aktiengesellschaft vorm.: *See—*
Arledter, Hanns F.; and Marek, Josef, 3,870,054.

Automation Industries, Inc.: *See—*
Turner, William R., 3,870,988.

Automotive Products Company Limited: *See—*
Firth, Anthony Christopher; and Child, Robin Edward, 3,870,131.

Avakian, Emik; and Laizerovich, David, to said Avakian, by said Laizerovich. Interconnecting systems and devices using conductive elastomer pellets in planar component supporting structures and in electronic circuit connectors. 3,870,385, Cl. 339-48.000.

Avakian, Emik: *See—*
Avakian, Emik; and Laizerovich, David (assors. to said Avakian, by said Laizerovich), 3,870,385.

Avco Corporation: *See—*
Bardach, Herbert, 3,870,607.
Breer, Robert A., 3,869,956.
Dickey, Thomas A., 3,869,862.
Mullin, George Cruise; Wetherby, Robert Earle; and Chevalier, Victor Oscar, 3,869,834.

Avis Products, Inc.: *See—*
Anderson, John D.; and Vander Stel, Gerald L., 3,869,827.
Avoset Food Corporation: *See—*
Jurasek, Walter R., 3,870,066.
Ayres, William M.: *See—*
Hills, Marian E.; and Ayres, William M., 3,870,577.
Aza-yunohara: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.
Azarowicz, Edward N., to Bioteknika International, Inc. Microbial degradation of petroleum. 3,870,599, Cl. 195-2.000.
B. F. Goodrich Company, The: *See—*
Horvath, James, 3,869,912.
Babaa, Ihsan Mustafa Hasan: *See—*
Adams, John William; Babaa, Ihsan Mustafa Hasan; and Hester, Donald Larry, 3,870,837.
Back, Gerhard; and Buehler, Arthur, to Ciba-Geigy AG. Heavy metal complexes of azo dyestuffs containing a 2-amino-3-hydroxypyridine as coupling component. 3,870,695, Cl. 260-146.00R.
Backer Rod Mfg. & Supply Co.: *See—*
Gibb, John F., 3,869,831.
Backus, Christopher W. Decorative flower. 3,870,586, Cl. 161-30.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fischer, Adolf, 3,869,826.
Fischer, Adolf, 3,870,502.
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,870,740.
Koehler, Waldemar; Riedel, Oswald; Scherer, Hertbert; and Schlereth, Georg, 3,869,914.
Pasedach, Heinrich; and Friederang, Albrecht, 3,870,761.
Baichtal, James R.; and McDonald, John C., to Vidar Corporation. Redundant data transmission system. 3,870,824, Cl. 179-7.00R.
Bailey, Carl W., III: *See—*
Falkehag, Sten I.; and Bailey, Carl W., III, 3,870,681.
Bailey, Donald W. Sailing vessel. 3,870,004, Cl. 114-39.000.
Baird, Richard W.; and Baird, William G., Jr., to W. R. Grace and Co. Cold plasma treatment of materials. 3,870,610, Cl. 204-165.000.
Baird, William G., Jr.: *See—*
Baird, Richard W.; and Baird, William G., Jr., 3,870,610.
Baker, Jesse L., to Mead Corporation, The. Apparatus for cleaning the cavities of casting and the like. 3,869,830, Cl. 51-8.00R.
Baker Oil Tools, Inc.: *See—*
Helmus, Sydney S., 3,870,101.
Balazs, Fulop: *See—*
Stefan, Mihaly; Hegedus, Zoltan; Balazs, Fulop; and Juhasz, Gyula, 3,870,574.
Baldwin Electronics, Inc.: *See—*
Wootton, Thomas S., 3,870,959.
Baliski, Stephen: *See—*
Norman, Harry H., 3,869,900.
Balstad, Edward. Roller skate construction. 3,870,324, Cl. 280-11.280.
Baltes, Josef, to Harburger, Oelwerke, Brinckman & Mergell. Process for manufacture of edible, flowable suspensions or solid glycerides in liquid glycerides or mixtures of liquid and solid glycerides and products obtained thereby. 3,870,807, Cl. 426-194.000.
Ban, Itsuki. System for driving a direct-current motor in synchronism with an external signal. 3,870,937, Cl. 318-314.000.
Banks, Robert L.: *See—*
Heckelsberg, Louis F.; and Banks, Robert L., 3,870,763.
Bannister, Brian, to Upjohn Company, The. Lincomycin analogs. 3,870,699, Cl. 260-210.00R.
Baranovsky, Leonid Sememovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.
Barbarow, Charles E. Mustache styling device. 3,870,055, Cl. 132-10.000.
Barber-Colman Company: *See—*
Fassell, W. Martin; and Bridges, Donald W., 3,870,631.
Bardach, Herbert, to Avco Corporation. Bearing Manufacture. 3,870,607, Cl. 204-15.000.
Barecki, Chester J., to American Seating Company. Semi-cantilever twin-seat chair. 3,870,363, Cl. 297-232.000.
Barnett, Irvin: *See—*
Afflerbach, Frank D.; Barnett, Irvin; and Peters, Walter B., 3,870,581.
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., to Marsan Manufacturing Company, Inc. Fastening apparatus for ostomy appliances. 3,869,762, Cl. 24-81.0AG.
Barth, Gerald Dean; and Alexander, John Bert, to Illinois Tool Works Inc. Self-clinching staple. 3,869,957, Cl. 85-49.000.
Bartlett, Christopher Leslie; and Willis, Peter Charles, to Rolls-Royce (1971) Limited. Measuring apparatus and system. 3,869,800, Cl. 33-174.00L.
Barton, William A.; and Stork, John E., to Speech Technology Corporation. Solid state digital automatic voice response system. 3,870,818, Cl. 179-1.0SM.
Bartram, James F.: *See—*
Dewey, Gordon C.; and Bartram, James F., 3,870,998.
BASF Aktiengesellschaft: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.
Bashark, Larry Thomas, to Whirlpool Corporation. Sensor for dishwasher. 3,870,417, Cl. 356-208.000.
Basias, Igor Pavlovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Battaglia, Larry A.: *See—*
Graham, Donald E.; and Battaglia, Larry A., 3,870,071.
Battelle Memorial Institute: *See—*
Charbonnier, Jean-Claude; and Tannenberger, Helmut, 3,870,561.
Baumoel, Joseph. Digital flowmeter. 3,869,915, Cl. 73-194.00A.
Baüsch, Gunther; Millauer, Christian; and Paul, Harald, to Werner & Pfleiderer. Continuously operating kneading and mixing screw device for kneading and mixing kneadable and mixable materials. 3,870,285, Cl. 259-191.000.
Baxter, Bobby G.; and Splitt, Theodore B., to Binkley Company, The. Retractabie king pin and clamping assembly. 3,870,342, Cl. 280-433.000.
Baxter, Roderick Carey; and Hart, Dennis Edward, to Marconi Company Limited, The. Tuning arrangements. 3,870,979, Cl. 334-14.000.
Bayer Aktiengesellschaft: *See—*
Diehr, Hans-Joachim; Kraft, Karl-Josef; and Sachs, Hanns Immo, 3,870,665.
Knipp, Ulrich, 3,870,372.
Noll, Klaus; Oertel, Gunter; and Schafer, Karl, 3,870,556.
Scharfe, Gerhard; and Grolig, Johann, 3,870,730.
Witt, Harro; and Dieterich, Dieter, 3,870,684.
Beach, William A.; and Schlauch, Richard M., to Permutit Company, Inc., The. Settling rate tester. 3,869,903, Cl. 73-61.400.
Bechert, Bertold: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.
Beck, Walter: *See—*
Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,870,768.
Becker, Wilhelm, to Reichhold-Albert Chemie Aktiengesellschaft. Curing agent for aqueous epoxide resin dispersions. 3,870,666, Cl. 260-21.000.
Beckers, Heinz, to Paul Forkardt Kommanditgesellschaft. Chuck. 3,870,323, Cl. 279-112.000.
Beckman Instruments, Inc.: *See—*
Neti, Radhakrishna M., 3,870,468.
Beem, W. Wayne: *See—*
Shimanckas, William J.; and Beem, W. Wayne, 3,870,258.
Beezer, Earl F., to Stelron Cam Company. Device for transmitting accurate translational and rotary movements. 3,869,924, Cl. 74-24.000.
Begley, Richard J.: *See—*
Garvey, Glenwood L.; and Begley, Richard J., 3,869,732.
Belanger, James A. Rotary finishing wheel. 3,869,833, Cl. 51-334.000.
Belart, Juan; Fink, Werner; Kircher, Dieter; and Von Grunberg, Hubertus, to ITT Industries, Inc. Brake pressure modulator. 3,870,377, Cl. 303-21.00F.
Belcher, Jack T. Method of manufacturing of a fiber reinforced structure and method of manufacture. 3,870,580, Cl. 156-181.000.
Bell, Alfred Wharton, to Siebe Gorman & Company Limited. Glove liner and glove comprising such liner. 3,869,726, Cl. 2-164.000.
Bell Telephone Laboratories Incorporated: *See—*
Adams, John William; Babaa, Ihsan Mustafa Hasan; and Hester, Donald Larry, 3,870,837.
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,870,416.
Carbrey, Robert Lawrence; Moran, John Christian; and Tsao-Wu, Nelson Tsin, 3,870,826.
Corwin, Walter Leo; Keeler, Robert Emerson; and Rubin, Philip Edward, 3,870,838.
Dillon, Joseph Francis, Jr.; Madison, Ernst Michael Gyorgy; and Van Uitert, Legrand Gerard, 3,870,397.
Weischedel, Herbert Rudolf; and Westerman, George Raymond, 3,870,943.
Beloit Corporation: *See—*
DeNoyer, Donald B., 3,870,628.
Getman, Darryl L.; and Swenson, Marshall G., 3,870,597.
Gokcen, Cem M., 3,870,451.
Penrod, William R., 3,870,454.
Belras AG: *See—*
Gneiding, Albert, 3,869,773.
Belsky, Stephen Edward; and Bonfield, John Henry, to Allied Chemical Corporation. Process for production of alkylene oxide adducts of iris(2-hydroxyalkyl)isocyanurate. 3,870,716, Cl. 260-248.0NS.
Bendix Corporation, The: *See—*
Carp, Ralph W., 3,870,378.
McCormick, Joseph L.; McMullen, Charles G.; and Woodall, Phillip J., 3,870,994.
Benmair, Yusuf: *See—*
Frei, Ephraim H.; Yerushalmi, Shmuel; and Benmair, Yusuf, 3,870,645.

Benner, Robert I.: *See—*
Tice, John D.; and Benner, Robert I., 3,870,624.

Bennett, Julia A. S. Apparatus for manually raising and lowering bulky packages. 3,870,358, Cl. 294-77.000.

Bennett, Richard H., to Knight Engineering and Molding Co. Child-proof aerosol cap. 3,870,187, Cl. 220-281.000.

Bennington, William E. Dental floss dispenser. 3,870,059, Cl. 132-92.00A.

Bennion, Jay B.: *See—*
Green, Glen R.; and Bennion, Jay B., 3,870,809.

Berchielli, Aldo S., to Yardney International Corp. Pyrotechnic device. 3,869,987, Cl. 102-37.400.

Berg, Raymond: *See—*
Greenfield, Walter; and Berg, Raymond, 3,870,146.

Berg, Roy E., to Interstate Utilities Corporation. Industrial scrubber. 3,870,484, Cl. 55-229.000.

Bergsman, Robert Paul, to Leonard Lebowitz, a part interest. Locking device. 3,870,842, Cl. 200-44.000.

Bergum, Bernard C.; and Oppedal, Tor, to ESB Incorporated. Battery having venting passageway outside of or in gas-pervious layers. 3,870,566, Cl. 136-111.000.

Berth Wikstrom AB: *See—*
Edlund, Lars Anders; and Wikstrom, Berth Atle, 3,870,855.

Bertling, Anton, to Siemens Aktiengesellschaft. Switch arrangement for a magnetic suspension railroad. 3,869,990, Cl. 104-130.000.

Bertucci, Dominick. Golf practice machine. 3,870,314, Cl. 273-185.00D.

Besijn, Jan Hendrik. Racking board. 3,870,165, Cl. 214-2.500.

Besten, Alfred D.: *See—*
Wildman, Claude L.; and Hellmer, George A., 3,869,856.

Betschart, Alois, Jr. Self-releasing ski-binding. 3,870,327, Cl. 280-11.35K.

Bettcher Manufacturing Corporation: *See—*
Patrick, Malcolm W.; and Adams, Joseph W., 3,870,052.

Bhalla, Sushil K.: *See—*
Hall, Richard E.; and Bhalla, Sushil K., 3,870,783.

Biagi, Alvaro D.; and Luganski, Dimitri, to Republic Electronics Industries Corporation. Distance measuring equipment for aircraft employing precision distance measuring means. 3,870,993, Cl. 343-6.50R.

Biegler, Hanns; and Wiljes, Juergen, to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler. Process for the production of alkali metal silicates. 3,870,532, Cl. 106-74.000.

Biesen, Kurt: *See—*
Werner, Udo; Biesen, Kurt; and Sroka, Jurgen, 3,870,269.

Bilas, Michael. Vehicle suspension. 3,870,336, Cl. 280-124.00F.

Bingham, Joseph Peter, to RCA Corporation. Line sequential color television recording system. 3,871,019, Cl. 358-4.000.

Binkley Company, The: *See—*
Baxter, Bobby G.; and Splitt, Theodore B., 3,870,342.

Binks, Sidney David; and Hurton, William, to Davy Instruments Limited. Method and apparatus for measuring mutually perpendicular dimensions. 3,870,890, Cl. 250-560.000.

Bio-Analytical Laboratories, Inc.: *See—*
Fiore, John M., 3,870,036.

Bioteknika International, Inc.: *See—*
Azarowicz, Edward N., 3,870,599.

Birchall, James Derek; and Cassidy, John Edward, to Imperial Chemical Industries, Limited. Phosphates. 3,870,737, Cl. 260-448.00R.

Biscardi, Charles T., to Merit Metal Products Corp. Deterrent spring clip. 3,870,355, Cl. 292-307.00R.

Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, to Stepan Chemical Company. Unsaturated amides of oxybis(benzenesulfonic acid) and their use as cross-linking agents. 3,870,768, Cl. 260-857.00G.

Blake, Edward S., to Monsanto Company. Substituted amides. 3,870,646, Cl. 252-107.000.

Blanco, Louis A.; and Meade, Hazel W., to Commercial Decal, Inc. Ceramic decalcomania. 3,870,536, Cl. 106-146.000.

Blazek, Jan: *See—*
Rauterkus, Karl Josef; and Blazek, Jan, 3,870,673.

Blinkilde, Paul J., to Epsex International, Inc. Vehicle gear selector control apparatus. 3,870,120, Cl. 180-82.00C.

Blood, Charles H. Web tension controller. 3,870,934, Cl. 318-7.000.

Blumenthal, Warren B., to N. L. Industries, Inc. Pigment and preparation thereof. 3,870,787, Cl. 423-598.000.

Blumenthal, Warren B., to NL Industries, Inc. Hafnium-titanium-calcium-oxygen product. 3,870,788, Cl. 423-598.000.

Boatman, Roger M.; and Hall, Melvin R., to Roger Boatman & Associates, Inc. In circuit electronic component tester. 3,870,953, Cl. 324-73.00R.

Boback, John G. Removable hinge arrangement. 3,869,753, Cl. 16-171.000.

Bobolev, Vasily Konstantinovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Boeing Company, The: *See—*
Cole, James Byron, 3,870,252.
Watts, John, 3,870,254.

Boese, Harold L.; and Hencey, Thomas R., Jr. Non-pollution motor with gas tube conductors. 3,870,942, Cl. 320-2.000.

Boggs, Roger L., to Caterpillar Tractor Co. Track roller with replaceable and reversible flanges. 3,869,931, Cl. 74-230.300.

Bollinger, Charles W. Device for regulating positive end expiratory pressure. 3,869,771, Cl. 128-188.000.

Bolt, Harry Collett; and Bolt, John Anthony. Shower cabinets. 3,869,734, Cl. 4-146.000.

Bolt, John Anthony: *See—*
Bolt, Harry Collett; and Bolt, John Anthony, 3,869,734.

Bond, Ralph W., to Whirlpool Corporation. Grounding mounting means. 3,870,392, Cl. 339-14.00R.

Bondarenko, Valentin Grigorievich: *See—*
Sarkisov, Rafael Tevosovich; Stepanian, Ernst Arakelovich; and Bondarenko, Valentin Grigorievich, 3,870,244.

Bonfield, John Henry: *See—*
Belsky, Stephen Edward; and Bonfield, John Henry, 3,870,716.

Bonnemay, Maurice; Bronoel, Guy Rene; Donnet, Jean-Baptiste; Lahaye, Jacques; and Sarradin, Joel Alain. Cathode for the reduction of oxygen and a rechargeable cell comprising said cathode. 3,870,565, Cl. 136-86.00A.

Booker, Arnold Bryce: *See—*
Lee, George W., 3,870,278.

Borg-Warner Corporation: *See—*
Ditzler, John L., 3,869,874.
Kuehner, Richard, 3,869,870.

Borisoglebsky, Alexei Gennadievich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sèsar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.

Borowski, Edward: *See—*
Gruszecki, Wojciech; Taszer, Emil; and Borowski, Edward, 3,870,708.

Borsini, Giancarlo: *See—*
Modena, Mario; Ragazzini, Mario; Borsini, Giancarlo; and Valera, Marco, 3,870,689.

Bost, Pierre-Etienne; Costantini, Michel; and Lartigau, Guy, to Rhone-Poulenc S.A. Process for the epoxidation of olefines. 3,870,729, Cl. 260-348.50L.

Boucher, Jean Raymond: *See—*
Iyengar, Rama; Zuber, Bretislav Paul; and Boucher, Jean Raymond, 3,869,902.

Bourat, Guy, to Rhone-Poulenc S.A. Apparatus for forced flow electrophoresis. 3,870,617, Cl. 204-301.000.

Bowman, Gary L., to Harter Corporation. Fully enclosed, adjustable, support column for a pivotal chair. 3,870,271, Cl. 248-406.000.

Bowman, Rush A. Handwork frame. 3,869,817, Cl. 38-102.400.

Boyd, Wilton E.; and Rennecker, David B., to Hoover Company, The. Interlocked conversion for a convertible cleaner. 3,869,751, Cl. 15-334.000.

Boyer, Robert A.; and Middendorf, John E., to Ralston Purina Company. Method of producing a meat simulating textured food product. 3,870,808, Cl. 426-250.000.

Boyle, John Terence Arnott: *See—*
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,870,721.

Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, to Givaudon Corporation. Bicyclic odorants. 3,870,659, Cl. 252-522.000.

Bozzuto, Carl Richard: *See—*
Klein, Herschel Alan; and Bozzuto, Carl Richard, 3,870,781.

Brackett, Robert D.; and Plasse, Paul A., to Polaroid Corporation. Novel laminating system. 3,870,582, Cl. 156-306.000.

Bradley, John J., to Paper Converting Machine Company. Method and apparatus for transverse folding of webs. 3,870,292, Cl. 270-68.00R.

Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, to Bell Telephone Laboratories, Incorporated. Wafer alignment apparatus. 3,870,416, Cl. 356-138.000.

Brahler, George R. Drive shaft. 3,869,877, Cl. 64-2.00R.

Brandigi, Carlo; and Fantechi, Guiliano. Method for forming a shaped cover for a flask. 3,869,966, Cl. 93-54.00R.

Brandstatter, Horst, to geobra Brandstatter GmbH & Co. KG. Toy cash register. 3,870,864, Cl. 235-1.00E.

Bratton, Myrla: *See—*
Klupp, George A., 3,870,311.

Braun, Dieter, to Fortuna-Werke Maschinenfabrik Aktiengesellschaft. Method and apparatus for manufacturing shoes. 3,869,745, Cl. 12-145.000.

Bray, Robert S.; and Tapley, Claude D., to Anaconda American Brass Co. Method of forming a strip having substantially differing thicknesses. 3,869,899, Cl. 72-366.000.

Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, to Dynamit Nobel Aktiengesellschaft. Electronic sensor for triggering safety devices during the crash of vehicles. 3,870,894, Cl. 307-9.000.

Breer, Robert A., to Avco Corporation. Pin assembly rivet. 3,869,956, Cl. 85-37.000.

Brems, John Henry. Harmonic trammel drive. 3,869,925, Cl. 74-25.000.

Bremsky Aktiengesellschaft, Firma: *See—*
Werner, Udo; Biesen, Kurt; and Sroka, Jurgen, 3,870,269.

Brennenstuhl, Hugo. Cable drums. 3,870,133, Cl. 191-12.20R.

Breuner, Gerald L. Autogyro. 3,870,251, Cl. 244-17.210.

Bridges, Donald W.: *See—*
Fassell, W. Martin; and Bridges, Donald W., 3,870,631.
Bridgestone Liquefield Gas Company, Ltd.: *See—*
Yamamoto, Katsuro, 3,870,588.
Bridgestone Tire Company Limited: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; and Yoneyama, Ken, 3,870,551.
Onishi, Akira; Yukuta, Toshio; Iseda, Yutaka; and Iwami, Kouichi, 3,870,620.
Briggs, Albert Theodore, to Wean United Inc. Collapsible reel. 3,870,243, Cl. 242-72.100.
Briggs, Henry P.: *See—*
Schneiderhan, Edward M.; Jones, John E.; and Briggs, Henry P., 3,870,865.
Briggs, Philip Stanley, to National Research Development Corporation. Process for tanning with a multivalent metal and an organic compound. 3,870,464, Cl. 8-94.260.
Brindley, Giles Skey, to National Research Development Corporation. Urinary control. 3,870,051, Cl. 128-422.000.
Brinly-Hardy Co., Inc.: *See—*
Doering, Charles W., 3,869,923.
Brisendine, Lynam S. Golf ball putting cup. 3,870,301, Cl. 273-34.00B.
Brisson, John R., to Lodal Inc. Overflow shield for refuse collection vehicle body hopper opening. 3,870,174, Cl. 214-303.000.
British Domestic Appliances Limited: *See—*
Eagle, John Scott, 3,869,970.
British Iron and Steel Research Association, The: *See—*
Cartwright, John Barry, 3,870,508.
British Leyland UK Limited: *See—*
Herron, Malachy, 3,870,444.
British Petroleum Company Limited, The: *See—*
Desty, Denis Henry; Whyman, Barry Herbert Francis; and Whitehead, David Montagu, 3,870,459.
Gegner, Eberhard, 3,870,642.
Brock, Robert J.; and Hudson, David W., to Kimberly-Clark Corporation. Laminates containing outer plies of continuous filament webs. 3,870,592, Cl. 161-148.000.
Brodnitz, Michael H.: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,870,800.
Broe, Max, to Aktieselskabet Chr. Nielsens Eftf. Motor driven valve. 3,870,274, Cl. 251-134.000.
Bronoel, Guy Rene: *See—*
Bonnemay, Maurice; Bronoel, Guy Rene; Donnet, Jean-Baptiste; Lahaye, Jacques; and Sarradin, Joel Alain, 3,870,565.
Brooks, Clennie Cecil. 3.58 Megacycle bandpass and oscillator detector for a color television. 3,871,021, Cl. 358-10.000.
Broverman, Alvin Y., to Kuhlman Corporation. Transformer terminal compartment cover means. 3,870,932, Cl. 317-157.600.
Brown-Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See—*
Kappeler, Peter; and Uhlig, Klaus, 3,870,346.
Brown, Charles C.: *See—*
Gemmel, John F.; and Brown, Charles C., 3,870,328.
Brown, Earle C.; Byers, Errol J.; and Kayani, Ghulam A., to Ontario Research Foundation. Moisture measuring probe. 3,870,951, Cl. 324-61.00P.
Brown Jug, Inc.: *See—*
O'Neill, Edward M., 3,870,156.
Brown, Marion L., Jr.: *See—*
Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., Jr., 3,870,782.
Brown, Michael A.; and Shade, Steven F. Kayak. 3,869,743, Cl. 9-2.00C.
Brown, Omar L., to Ermal C. Fraze. Can end with inseparable tear strip. 3,870,001, Cl. 113-121.00C.
Brown, Terry D.; Delap, Joseph A.; and Nasser, Benny E., Jr., to Phillips Petroleum Company. Preparation of silica-containing compositions. 3,870,656, Cl. 252-451.000.
Brown, William L.; and Shonebarger, Francis J., to Anchor Hocking Corporation. Method and apparatus for applying plastisol coating of uniform thickness to glass containers. 3,870,015, Cl. 118-63.000.
Brown & Williamson Tobacco Corporation: *See—*
Heitkamp, Norman D.; Merker, Steven L.; and Stungis, George E., 3,870,053.
Brugger, Hans; and Mallener, Helmut, to Zahnradfabrik Friedrechshafen AG. Process for nitriding unalloyed or low-alloy steel. 3,870,572, Cl. 148-16.500.
Brunette, Fredrick: *See—*
Monet, John E.; and Brunette, Fredrick, 3,870,154.
Brunkhorst, Lloyd E.: *See—*
Dueker, James E.; and Brunkhorst, Lloyd E., 3,870,887.
Brunner, Heinz, to Mayer & Cie Maschinenfabrik. Adjusting means for adjustable parts in knitting machines. 3,869,879, Cl. 66-19.000.
BTR Industries Limited: *See—*
Davies, Graham Leighton, 3,870,041.
Bucaro, Russell J., to Sequist Valve Company. Variable spray rate aerosol. 3,870,205, Cl. 222-402.170.
Buchanan, Donald George: *See—*
Smith, Colin Howard Stanwell; Gosling, Alexander Bennett; and Buchanan, Donald George, 3,870,321.
Buchel, Karl Heinz: *See—*
Jager, Gerhard; Plempel, Manfred; and Buchel, Karl Heinz, 3,870,726.
Buck, James R., to Buck Tool Company. Self-ejecting chuck key. 3,869,943, Cl. 81-90.00A.
Buck, Robert T., to Corning Glass Works. Liquid and aerosol collecting device. 3,870,014, Cl. 118-52.000.
Buck Tool Company: *See—*
Buck, James R., 3,869,943.
Buehler, Arthur: *See—*
Back, Gerhard; and Buehler, Arthur, 3,870,695.
Buendia, Jean: *See—*
Martel, Jacques; Toromanoff, Edmond; and Buendia, Jean, 3,870,710.
Martel, Jacques; Buendia, Jean; and Toromanoff, Edmond, 3,870,711.
Buffett, Thomas Vigus, to International Partners Research Corporation. Tray or crate. 3,870,188, Cl. 220-72.000.
Building Components Research, Inc.: *See—*
Wahlquist, Carl D., 3,869,841.
Bullock, Norman J., to W. M. Cissell Manufacturing Company. Garment finishing apparatus. 3,869,815, Cl. 38-77.600.
Bunn, George Edward, to Lucas Aerospace Limited. Combustion chambers for gas turbine engines. 3,869,864, Cl. 60-39.650.
Burdick, Steve; and Picard, Roger. Transportation cart. 3,870,333, Cl. 280-47.350.
Burgeson, Oscar Burge, to Stanley Works, The. Hand tool connection and trim collar therefor. 3,870,091, Cl. 145-29.00R.
Burkard, Edward A.; and Kossuth, Donald A., to National Gypsum Company. Gypsum set accelerator. 3,870,538, Cl. 106-315.000.
Burke, Edward F.; and Holmes, Douglas B., to Polaroid Corporation. Processor for photographic film cassettes. 3,871,013, Cl. 354-317.000.
Burke, Frederick: *See—*
Schwartz, Robert C.; and Burke, Frederick, 3,870,411.
Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Hypodermic syringe body structure. 3,870,044, Cl. 128-220.000.
Burley, Murray E., to S. Madill Ltd. Mobile spar. 3,870,158, Cl. 212-8.00R.
Burlington Industries, Inc.: *See—*
Huber, Kenneth C., 3,870,933.
Swidler, Ronald; Smith, Ray S.; and Miller, Harry A., 3,870,555.
Burns, James W., to Xerox Corporation. Image intensifier tube with improved photoemitter surface. 3,870,921, Cl. 313-346.00R.
Burron Medical Products, Inc.: *See—*
Burke, George K.; and Raines, Kenneth, 3,870,044.
Busby, Llewellyn D., to General Electric Company. Steam iron. 3,869,816, Cl. 38-77.830.
Bush Boake Allen Limited: *See—*
Humphrey, Anthony Martin, 3,870,810.
Butler, Florence P.: *See—*
Weisberg, Alfred M.; and Butler, Florence P., 3,870,619.
Butler, Ralph R., to Hammermill Paper Company. Combination reusable carton and lift-out carry tray for paper and three-way cover. 3,870,222, Cl. 229-44.00R.
Button, David; and Hopkins, Philip Ward, to U.C.C. International Limited. Bell housings for mounting electric motors. 3,870,908, Cl. 310-91.000.
Buurman, Herman, to U.S. Philips Corporation. Method of manufacturing hollow glass articles. 3,870,498, Cl. 65-106.000.
Byers, Errol J.: *See—*
Brown, Earle C.; Byers, Errol J.; and Kayani, Ghulam A., 3,870,951.
C. J. I. Industries, Inc.: *See—*
Rozner, Allan, 3,869,880.
C. J. Patterson Company: *See—*
Tenney, Ralph J., 3,870,799.
C. Reichert Optische Werke AG: *See—*
Steinbatz, Alfred; and Kappl, Gerhard, 3,871,009.
Cadariu, Emil E.; and Macovei, Alexandru A., to Spitalul Coltea. Apparatus for observations, photographs and interventions in the post-rhinal-pharyngeal regions. 3,870,037, Cl. 128-10.000.
Calgon Corporation: *See—*
Erskine, Donald Baldwin, 3,870,632.
California Cement Shake Co., Inc.: *See—*
Jakel, Gus R., 3,870,777.
California Laboratory Industries, Inc.: *See—*
Froman, Seymour; and Chandler, William L., 3,870,602.
Campbell, Robert W., to Phillips Petroleum Company. Arylene sulfide polymers. 3,870,686, Cl. 260-79.100.
Campbell, Robert W., to Phillips Petroleum Company. Arylene sulfide polymers. 3,870,687, Cl. 260-79.100.
Camras, Marvin, to IIT Research Institute. Video transducer system with magnetic transducer head having output winding means resonant at a mid band resonance frequency. 3,871,024, Cl. 360-33.000.
Canadian Cellulose Company, Limited: *See—*
Gibney, Kelly B.; Howard, John; and Evans, Russell S., 3,870,703.
Canick, Leon N.; and Aldrich, Charles S., to Precision Mechanisms Corporation. Tape perforator. 3,870,224, Cl. 234-110.000.
Canon Kabushiki Kaisha: *See—*
Nakamoto, Soichi; and Yanagisawa, Takeshi, 3,870,418.
Cantaloube, Bernard Andre: *See—*
Lacroix, Armand Jean-Baptiste; Quillevere, Herve Alain; Cantaloube, Bernard Andre; and Caruel, Jacques Emile Jules, 3,869,865.
Capossela, Anthony C.; McGuire, Michael T.; Smith, Gordon C.; and Albaum, Joseph D., to General Foods Corporation. Method for improving texture of bread/bread crumbs. 3,870,806, Cl. 426-152.000.

Capossela, Anthony C., Jr.: *See—*
Siems, Ruth M.; Capossela, Anthony C., Jr.; Halligan, John F.; and Wyss, C. Robert, 3,870,803.

Caprio, Gerald L., to Motorola, Inc. Limiting detector circuit and method of operating same. 3,871,023, Cl. 358-28.000.

Carbrey, Robert Lawrence; Moran, John Christian; and Tsao-Wu, Nelson Tsin, to Bell Telephone Laboratories, Incorporated. Tone control system for a time division switching system. 3,870,826, Cl. 179-15.0BY.

Carisey, Camille, to Compagnie Industrielle Des Telecommunications Cit-Alcatel. Cassette-handling system. 3,870,247, Cl. 242-198.000.

Carissimi, Massimo; and Ravenna, Franco. Potassium derivatives of 2-phenyl-6-sulphamyl-7-chloro-1,2,3,4-tetrahydro-4-quinazolinone. 3,870,720, Cl. 260-256.50R.

Carling O'Keefe Limited: *See—*
Dilanni, Daniel, 3,870,175.

Carlson, Elmer A., to International Telephone and Telegraph Corporation. Ignition system and components thereof. 3,870,929, Cl. 317-96.000.

Carp, Ralph W., to Bendix Corporation, The. Adaptive braking system control wheel selection by coefficient comparison. 3,870,378, Cl. 303-21.0EB.

Carr, George P.; and Mason, James A., Jr., to Xerox Corporation. Rolling process. 3,869,896, Cl. 72-108.000.

Carr, Hugh B.: *See—*
Finke, Harry P.; Carr, Hugh B.; and Wilson, Carl D., 3,870,079.

Carter Mfg., Inc.: *See—*
Horrell, Robert E., 3,870,096.

Carter, Ronald W.; and Nash, Charles D., to UMC Industries, Inc. Paper currency validator. 3,870,629, Cl. 209-111.800.

Carton Sales, Inc.: *See—*
Allen, Corey M., 3,870,135.

Cartwright, John Barry, to British Iron and Steel Research Association, The. Electroslag refining. 3,870,508, Cl. 75-10.000.

Caruel, Jacques Emile Jules: *See—*
Lacroix, Armand Jean-Baptiste; Quillevere, Herve Alain; Cantaloube, Bernard Andre; and Caruel, Jacques Emile Jules, 3,869,865.

Casale, Renato, to Ital Elettronica S.p.A. Scanning device for scintigraphy. 3,870,886, Cl. 250-367.000.

Casco Products Division, Sun Chemical Corporation: *See—*
Horwitt, Laurence G.; and Mattis, Donald J., 3,870,857.

Case, Cecil L., to Hesston Corporation. Combination hydraulic cylinder and accumulator. 3,869,861, Cl. 60-413.000.

Cassidy, John Edward: *See—*
Birchall, James Derek; and Cassidy, John Edward, 3,870,737.

Castany Ferre, Jose; and Sanrama Padro, Ramon. Method for the manufacture and pocket's assembling. 3,870,000, Cl. 112-262.000.

Castel, Yvon; and Castela, Andre, to Institut Francais Du Petrole Des Carburants et Lubrifiants. Device for taking samples from loose ground layers. 3,870,112, Cl. 175-93.000.

Castela, Andre: *See—*
Castel, Yvon; and Castela, Andre, 3,870,112.

Castro, Roger Albert; Orman, Richard John; and Ryan, James Ernest, to Imperial Chemical Industries Limited. Method of making shaped articles. 3,870,775, Cl. 264-53.000.

Caterpillar Tractor Co.: *See—*
Boggs, Roger L., 3,869,931.

Catherino, Henry A., to General Electric Company. Use of $Ni(OH)_2$ in pressed plate electrodes. 3,870,562, Cl. 136-24.000.

Celanese Corporation: *See—*
Jones, Rufus S.; and Conciatori, Anthony B., 3,870,685.

Century, Bernard A., to Allied Steel & Tractor Products, Incorporated. Stepper carriage advancement system. 3,870,279, Cl. 254-105.000.

Chacon, Manuel Frank, to Johnson Service Company. Audio-communication system having a plurality of interconnected stations. 3,870,829, Cl. 179-30.000.

Chadha, Rajendra Nath, to Stauffer Chemical Company. Method of curing organic polymers and copolymers. 3,870,766, Cl. 260-825.000.

Chadwick-Helmuth Electronics, Inc.: *See—*
Helmuth, James G., 3,870,924.

Chandler, William L.: *See—*
Froman, Seymour; and Chandler, William L., 3,870,602.

Charbonnier, Jean-Claude; and Tannenberger, Helmut, to Battelle Memorial Institute. Electric accumulator. 3,870,561, Cl. 136-6.0LN.

Chase, Bert, to Chase, Virginia; Miller, Dorothy; and Paxton, Ruby, part interest to each. Fryer. 3,869,972, Cl. 99-410.000.

Chase-Shawmut Company, The: *See—*
Salzer, Erwin, 3,870,984.

Chase, Virginia: *See—*
Chase, Bert, 3,869,972.

Chernetsky, Tom Pavlovich: *See—*
Larionov, Igor Naumovich; and Chernetsky, Tom Pavlovich, 3,870,850.

Chernyavsky, Vladimir Pavlovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; and Kadi-Ogly, Ibragim Akhmedovich, 3,870,913.

Chevalier, Victor Oscar: *See—*
Mullin, George Cruise; Wetherby, Robert Earle; and Chevalier, Victor Oscar, 3,869,834.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency dividing circuit. 3,870,970, Cl. 331-25.000.

Chikazawa, Hiroyuki, to Sony Corporation. Switching circuit. 3,870,905, Cl. 307-254.000.

Child, Robin Edward: *See—*
Firth, Anthony Christopher; and Child, Robin Edward, 3,870,131.

Chiosso, Thomas E. Teaching aid structure. 3,869,829, Cl. 47-39.000.

Church, James A. Solid state electronic control. 3,869,854, Cl. 58-33.000.

Churchward, Leonard: *See—*
MacMillan, Donald Stuart; and Churchward, Leonard, 3,869,744.

Ciba-Geigy AG: *See—*
Back, Gerhard; and Buehler, Arthur, 3,870,695.
Froehlich, Alfred; and Loeffel, Hansrolf, 3,870,697.
Piller, Bernhard, 3,870,519.
Somlo, Tibor, 3,870,707.
Ulrich, Paul; and Stauble, Max, 3,870,717.

Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,870,706.
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 3,870,714.
Hunger, Alfred; and Janssen, Hans-Jochen, 3,870,796.

Cibie Projecteurs: *See—*
Puyplat, Olivier, 3,870,876.

Ciments Lafarge S.A.: *See—*
Marechal, Claude, 3,870,465.

Circle Engineering Co., Inc.: *See—*
Solomon, Milton, 3,870,371.

Cities Service Oil Company: *See—*
Kerschner, Paul M.; and Marcellis, Alphonso W., 3,870,643.

Clairion Co., Ltd.: *See—*
Nara, Hirotoshi; Watanabe, Wataru; Yokota, Tadashi; and Yanagi, Chiak, 3,870,248.

Clark, Burton Parker, to General Electric Company. Accelerator. 3,869,960, Cl. 89-33.0CA.

Clarke-Pounder, Ian J. H., to Improved Machinery Inc. Apparatus for clarifying an influent water. 3,870,635, Cl. 210-221.000.

Clason, Jan Christiaan, to Hazemeijer B.V. Vacuum circuit interrupter with a plurality of interrupting units. 3,870,845, Cl. 200-144.00B.

Claxton, George P.: *See—*
Grisar, J. Martin; and Claxton, George P., 3,870,723.

Clemens, David H.; and Hamann, Herman C., to Rohm and Haas Company. Porous styrene polyfunctional methacrylate polymers. 3,870,663, Cl. 260-2.50B.

Clouth Gummiwerke AG: *See—*
Gilles, Martin; and Thiel, Anton, 3,870,337.

CMI Corporation: *See—*
Allen, Thomas E., 3,870,427.

Cobb, Willard J. Mobile hand truck having a detachable load craddle. 3,870,177, Cl. 214-372.000.

Coberley, Daniel A., to Hurletron Incorporated. Digital motor control system for web registration. 3,870,936, Cl. 318-85.000.

Cohen, Milton J. Twistable bag type dispenser. 3,870,198, Cl. 222-105.000.

Cole, Edward L.: *See—*
McCoy, Frederic C.; and Cole, Edward L., 3,870,765.

Cole, James Byron, to Boeing Company, The. Variable camber airfoil trailing edge. 3,870,252, Cl. 244-42.0CC.

Cole, Kenneth E. Sidewalk coaster sled. 3,870,334, Cl. 280-87.010.

Cole, Leonard Edward: *See—*
Plaister, John Edward; and Cole, Leonard Edward, 3,869,893.

Colgate-Palmolive Company: *See—*
Schaar, Charles H., 3,869,761.

Collins, Robert J., to Upjohn Company, The. Animal feed and process. 3,870,793, Cl. 424-269.000.

Colpitts, Willard E. Spare wheel carrier for logging trucks. 3,870,179, Cl. 214-454.000.

Columbia Broadcasting System, Inc.: *See—*
Gabor, Dennis, 3,869,904.

Columbia Gas System Service Corporation: *See—*
Eberle, Arthur; and Spitzer, Nicholas A., 3,870,869.

Combustion Engineering, Inc.: *See—*
Hurlbut, William Barrett, Sr.; Liebig, Preston Dean; and Maurin, Gerald, 3,870,487.
Klein, Herschel Alan; and Bozzuto, Carl Richard, 3,870,781.
Nelson, Hugh Wharton, 3,870,467.

Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 3,869,995.

Comet Corporation: *See—*
Iino, Hideo; and Iizuka, Satoru, 3,870,306.

Commercial Decal, Inc.: *See—*
Blanco, Louis A.; and Meade, Hazel W., 3,870,536.

Compagnie Industrielle Des Telecommunications Cit-Alcatel: *See—*
Carisey, Camille, 3,870,247.
Rabasse, Jean, 3,870,969.

Compressed Air Products Inc.: *See—*
Austin, George E.; and Kalyan, Jagdish C., 3,869,962.

Conciatori, Anthony B.: *See—*
Jones, Rufus S.; and Conciatori, Anthony B., 3,870,685.

Concorde Fibers Inc.: *See—*
Norwood, David W., 3,870,241.

Condon, Nancy J., to Shell Oil Company. Stabilized block copolymer compositions. 3,870,676, Cl. 260-33.6AQ.

Coniglio, James John: *See—*
Wiley, Robert Emerson; and Coniglio, James John, 3,870,987.

Consiglio, Thomas J.: *See—*
Dennis, Roderick A.; Consiglio, Thomas J.; and McGowan, Gerald, 3,870,819.

Continental Can Company, Inc.: *See—*
Frankenberg, Henry E., 3,870,203.

Continental Oil Company: *See—*
Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., 3,870,373.

Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., Jr., to Mississippi Chemical Corporation. Ammonium nitrate neutralizer. 3,870,782, Cl. 423-396.000.

Cooper, Herbert. Combined motor home and yacht. 3,870,011, Cl. 115-0.50A.

Cooper, Marvin: *See—*
Koury, Ronald William; and Cooper, Marvin, 3,870,220.

Cope Allman Plastics Limited: *See—*
Majors, Eric Desmond Thomas; and Davey, John Kenneth, 3,870,448.

Cording, Eldon F., to Heede International, Inc. Joy stick controller for tower crane. 3,870,161, Cl. 212-56.000.

Cordura Corporation: *See—*
Schroeder, Marvin C., Jr., 3,869,980.

Corning Glass Works: *See—*
Buck, Robert T., 3,870,014.
Farrauto, Robert J.; Hoekstra, Karl E.; and Shoup, Robert D., 3,870,658.
Love, Roy E., 3,870,398.
Racki, Jerome G.; and Thiel, Frank L., 3,870,396.
Randall, Lyman J.; and Seward, Thomas P., III, 3,870,399.
Weetall, Howard H., 3,870,543.

Cornsweet, Tom N., to Acuity Systems, Incorporated. Method and means for measuring the refractive properties of an optical system. 3,870,415, Cl. 356-124.000.

Cortina O., Ignacio. Reclinable chairs and seats. 3,870,364, Cl. 297-294.000.

Corwin, Walter Leo; Keeler, Robert Emerson; and Rubin, Philip Edward, to Bell Telephone Laboratories, Incorporated. Means and apparatus for fault locating pulse regenerators. 3,870,838, Cl. 179-175.31R.

Costantini, Michel: *See—*
Bost, Pierre-Etienne; Costantini, Michel; and Lartigau, Guy, 3,870,729.

Coulon, Andre, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Component parts of welded rotors. 3,869,777, Cl. 29-183.000.

Cowling, Ronald; and Greenshields, James Nairn, to Imperial Chemical Industries Limited. Paper treatment. 3,870,559, Cl. 117-201.000.

Crompton & Knowles Corporation: *See—*
Feeman, James F., 3,870,696.

Crook, James E.; Cutler, John F., Jr.; and Khanna, Jai K., to Wallace Murray Corporation. Engine supercharging air cooling method. 3,870,029, Cl. 123-119.0CD.

Crook, Peter John; and Riley, Stephen Philip, to Pilkington Brothers Limited. Foamed reaction product of a resole with a sulfonated novolac. 3,870,661, Cl. 260-2.50F.

Cryderman, Gordon R. Snowmobile ski anti-skid assembly. 3,870,331, Cl. 280-28.000.

Csepeli Femmu: *See—*
Stefan, Mihaly; Hegedus, Zoltan; Balazs, Fulop; and Juhasz, Gyula, 3,870,574.

Cubberley, Mitchell H., to Cubco, Inc. Releasable ski binding with regulatable toe release mechanism. 3,870,326, Cl. 280-11.35T.

Cubco, Inc.: *See—*
Cubberley, Mitchell H., 3,870,326.

Cummins-Allison Corp.: *See—*
Schneiderhan, Edward M.; Jones, John E.; and Briggs, Henry P., 3,870,865.

Cuny, John J., to International Telephone and Telegraph Corporation. Discharge device including channel type electron multiplier having ion adsorptive layer. 3,870,917, Cl. 313-105.000.

Cutler, Ivan B., to University of Utah. Method of creating a foamed glass product from waste glass. 3,870,496, Cl. 65-22.000.

Cutler, John F., Jr.: *See—*
Crook, James E.; Cutler, John F., Jr.; and Khanna, Jai K., 3,870,029.

Cutting Room Appliances Corp.: *See—*
Paterson, Stephen, 3,870,290.

Cyborg Corporation: *See—*
James, J. Michael, 3,870,034.

Czaja, Robert F.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,870,753.

Daams, Jasper: *See—*
Van Daalen, Jan Johannes; and Daams, Jasper, 3,870,504.

Dacmont, Inc.: *See—*
Graznak, Charles, 3,870,076.

Dahl, Hilbert D.: *See—*
Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., 3,870,373.

Daido Metal Company, Ltd.: *See—*
Morisaki, Nobukazu, 3,870,383.

Daikin Kogyo Co. Ltd.: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Daimei Tsushin Sangyo Kabushiki Kaisha: *See—*
Kusama, Mikio, 3,870,836.

Dainippon Pharmaceutical Co. Ltd.: *See—*
Uno, Hitoshi; and Irie, Akira, 3,870,724.

D'Amato, Nicholas J. Shower door saddle. 3,869,735, Cl. 4-146.000.

Damy, Sergio R. Railroad track construction. 3,870,230, Cl. 238-26.000.

Danesh, Andre. Preparation of salts and complexes of substituted oxyacetate. 3,870,749, Cl. 260-484.00P.

Dannenmann, Paul; and Kratz, Gunter, to G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken. Pump. 3,870,438, Cl. 417-356.000.

Darces, Jean-Francois: *See—*
Merigoux, Henri; Darces, Jean-Francois; and Exertier, Jean-Yves, 3,870,880.

Darnell, Robert S.; and Morrissey, Everett G., to A. J. Oster, Co. White metal casting alloy and method of making same. 3,870,513, Cl. 75-175.00A.

Darrah, John W., III; and Williams, Dick W., to Monsanto Company. Lightweight plastic container case-packing method and apparatus. 3,869,843, Cl. 53-26.000.

Darre, Allan; and Springstubbe, Wolf, to Siemens Aktiengesellschaft. Digital time-division multiplex switching method. 3,870,827, Cl. 179-15.0AP.

Dart Industries Inc.: *See—*
Arndt, Frederick W.; and Gavin, Joseph H., 3,870,488.
Ihlenfeld, Russell E., 3,869,968.

Davey, John Kenneth: *See—*
Majors, Eric Desmond Thomas; and Davey, John Kenneth, 3,870,448.

Davidson, Harley R.: *See—*
Davis, Austin L.; and Davidson, Harley R., 3,869,982.

Davies, Graham Leighton, to BTR Industries Limited. Surgical dressings. 3,870,041, Cl. 128-156.000.

Davies, John Hazlewood; Palmer, Bertram Joseph; and Fisher, Leslie George, to GKN Transmissions Limited. Universal joints. 3,869,878, Cl. 64-8.000.

Davis, Austin L.; and Davidson, Harley R., to Howe Richardson Scale Company. Weighing and printing apparatus. 3,869,982, Cl. 101-96.000.

Davis, Edgar H. Combined ski boot and binding. 3,870,325, Cl. 280-11.35N.

Davis, Ernest D., to Norfin, Inc. High speed marking device. 3,869,981, Cl. 101-91.000.

Davy Instruments Limited: *See—*
Binks, Sidney David; and Hurton, William, 3,870,890.

Deadman, Vernon E. Torque arm assembly for nip rollers. 3,869,884, Cl. 68-258.000.

Deardurff, Lawrence R.: *See—*
Workman, Gerald B.; and Deardurff, Lawrence R., 3,870,547.

Debesis, John R., to General Electric Company. Reflective multiple contact for semiconductor light conversion elements. 3,871,008, Cl. 357-65.000.

Debesis, John R., to General Electric Company. Reflective coated contact for semiconductor light conversion elements. 3,871,016, Cl. 357-68.000.

DeBrocke, Ben H. Golf club swing training device. 3,870,316, Cl. 273-186.00E.

de Bucs, Eugen Szabo: *See—*
Oesterhelt, Gerhard; Winkler, Josef; Falkenberg, Dieter; and de Bucs, Eugen Szabo, 3,870,568.

DeCaro, Charles J., to Textron Inc. Driving tool. 3,869,942, Cl. 81-54.000.

Decatur Electronics, Inc.: *See—*
Fathauer, George H., 3,870,990.

Decca Limited: *See—*
Smith, Colin Howard Stanwell; Gosling, Alexander Bennett; and Buchanan, Donald George, 3,870,321.

Deere & Company: *See—*
Ahrens, Barry Louis, 3,869,937.
Hanser, Paul Edmund; and Snyder, William Lee, 3,870,074.
Lee, Robert Stormo, 3,870,512.

Deering Milliken Research Corporation: *See—*
McCullough, Robert W., 3,869,770.

Deffenbaugh, James F.; Williams, Arthur L.; and Ellis, Robert S., to Wean United, Inc. Welding machines. 3,870,851, Cl. 219-97.000.

De Fraeye, Dirk Jules Remi; and Mewissen, Jan Alfons Catharina, to U.S. Philips Corporation. Electric incandescent lamp. 3,870,920, Cl. 313-278.000.

De Frees, Joseph H. Vapor proof junction box in combination with electrical float switch adjustable for height. 3,870,844, Cl. 200-84.00R.

De George, Edward C.: *See—*
Hellman, Wayne R.; Gottschalk, Klaus; and De George, Edward C., 3,870,919.

Del Mar Engineering Laboratories: *See—*
Elder, Boyd B., 3,870,297.

Delalande S.A.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,870,728.

DeLaMater, George B.; Herrick, Elbert C.; and Milligan, Barton, to Air Products and Chemicals Inc. Isocyanates from urethanes. 3,870,739, Cl. 260-453.00P.

Delap, Joseph A.: *See—*
Brown, Terry D.; Delap, Joseph A.; and Nasser, Benny E., Jr., 3,870,656.

Demag Aktiengesellschaft: *See—*
Kreuz, Otto; and Raab, Stephan, 3,870,097.

Dempsey, Russell M.; Nolan, Mary E.; La Conti, Anthony B.; and Torkildsen, Robert A., to General Electric Company. Current controlled regulation of gas evolution in a solid polymer electrolyte electrolysis unit. 3,870,616, Cl. 204-230.000.

DenBleyker, John R. Slide projector. 3,870,412, Cl. 353-109.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshida, Shuji; and Iguchi, Tateo, 3,870,769.

Dennis, Roderick A.; Consiglio, Thomas J.; and McGowan, Gerald. Conference call apparatus for use with key telephone system equipment. 3,870,819, Cl. 179-1.0CN.

DeNoyer, Donald B., to Beloit Corporation. Parts separator. 3,870,628, Cl. 209-90.000.

Dentsply Research and Development Corporation: *See*—
Gonser, Donald I., 3,870,047.

D'Errico, John J., to Solitron Devices, Inc. Means to control pulse width and repetition rate of binary counter means. 3,870,962, Cl. 328-58.000.

Derrien, Michel: *See*—
Torck, Bernard; Derrien, Michel; and Franck, Jean-Pierre, 3,870,653.

Desty, Denis Henry; Whyman, Barry Herbert Francis; and Whitehead, David Montagu, to British Petroleum Company Limited, The. Burner for use with fluid fuels. 3,870,459, Cl. 431-328.000.

Detiker, Hans. Open clamp with means for closing the band ends. 3,869,944, Cl. 81-9.300.

Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler: *See*—
Biegler, Hanns; and Wiljes, Juergen, 3,870,532.
Krzyminski, Harald, 3,870,569.
Lussling, Theodor; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,870,746.

Dewey Electronic Corporation, The: *See*—
Dewey, Gordon C.; and Bartram, James F., 3,870,998.

Dewey, Gordon C.; and Bartram, James F., to Dewey Electronic Corporation, The. Apparatus for measuring and summing time differences. 3,870,998, Cl. 343-100.0CL.

Diamond Electric Mfg. Co., Ltd.: *See*—
Ishida, Yoshio, 3,870,028.

Diaz, Jose A. Safety lock. 3,869,886, Cl. 70-93.000.

Dickey, Thomas A., to Avco Corporation. Fuel conservation system for multi-engine powered vehicle. 3,869,862, Cl. 60-39.150.

DICO Company, Inc.: *See*—
Meads, Charles D., 3,870,356.

Didenko, Nikolai Sidorovich: *See*—
Rybalko, Alexei Petrovich; Karpekin, Viktor Vladimirovich; Didenko, Nikolai Sidorovich; and Volokhov, Ivan Ivanovich, 3,869,871.

Die Evolution S.A.: *See*—
Hamel, Edmund, 3,869,852.

DIEHL: *See*—
Korner, Otto, 3,870,380.

Diehr, Hans-Joachim; Kraft, Karl-Josef; and Sachs, Hanns Immo, to Bayer Aktiengesellschaft. Process for making pressure molded lignocellulose articles comprising isocyanurate group forming mold release agent. 3,870,665, Cl. 260-17.200.

Dieringer, Andrew M., to Rexnord Inc. Track level indicator. 3,869,805, Cl. 33-338.000.

Dieterich, Dieter: *See*—
Witt, Harro; and Dieterich, Dieter, 3,870,684.

Dilanni, Daniel, to Carling O'Keefe Limited. Decapping of bottles and decanting the liquid contents thereof. 3,870,175, Cl. 214-304.000.

Dillon, Joseph Francis, Jr.; Madison, Ernst Michael Gyorgy; and Van Uitert, Legrand Gerard, to Bell Telephone Laboratories, Incorporated. Thin film magneto-optic switch. 3,870,397, Cl. 350-96.0WG.

Dingwall, Andrew Gordon Francis, to RCA Corporation. Complementary field effect transistor differential amplifier. 3,870,966, Cl. 330-30.00D.

Dinklage, Horst: *See*—
Fink, Herbert; Munzer, Manfred; and Dinklage, Horst, 3,870,557.

DiPerry, John, to United States of America, Navy. Automatic gain integrator control. 3,870,997, Cl. 343-18.00E.

Ditzler, John L., to Borg-Warner Corporation. Refrigeration apparatus with defrosting system. 3,869,874, Cl. 62-278.000.

Dixson, Bruce E.; Hoffman, Marcus I., III; and Walls, Milton A., to Air Purification Systems, Inc. Particulate and/or gas filters and associated filtering equipment to purify air to be breathed by persons in vehicles and/or buildings, and manufacture and installation of these filters. 3,870,495, Cl. 55-489.000.

Doane, DeWitt H. Grease filter for kitchen ventilators. 3,870,494, Cl. 55-443.000.

Dr. Ing Rudolf Hell GmbH: *See*—
Fels, Werner, 3,870,518.

Doering, Charles W., to Brinly-Hardy Co., Inc. Debris collecting apparatus. 3,869,923, Cl. 74-13.000.

Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., to Continental Oil Company. Underground coal slurry concentrating sump. 3,870,373, Cl. 302-14.000.

Dolle, David E., to Aetna-Standard Engineering Company. Shear apparatus with improved blade holding means. 3,869,949, Cl. 83-320.000.

Dompke, Ronald F.: *See*—
Engler, John R.; and Dompke, Ronald F., 3,870,352.

Domtar Limited: *See*—
Hussey, Edward B., 3,870,553.
Shisko, Walter S., 3,870,544.

Doner, John T., to Whirlpool Corporation. Glass-ceramic cooktop construction. 3,870,862, Cl. 219-464.000.

Donnelley Mirrors, Inc.: *See*—
Wilson, Harold R.; and Kamerling, Marc A., 3,870,404.

Donner, Sigmar, to Kleindienst & Co. Maschinenfabrik. Apparatus for the extraction of sheets. 3,870,294, Cl. 271-3.100.

Donnet, Jean-Baptiste: *See*—
Bonnemay, Maurice; Bronoel, Guy Rene; Donnet, Jean-Baptiste; Lahaye, Jacques; and Sarradin, Joel Alain, 3,870,565.

Dorf, Marvin L., to Goodyear Tire & Rubber Company, The. Structures of reinforced elastomeric material. 3,869,933, Cl. 74-234.000.

Doschko, Werner; Fohlisch, Wolfgang; and Wensch, Alfred, to Imperial Chemical Industries Limited. Friction bush. 3,869,853, Cl. 57-77.400.

Dosen, Masashi, to Sony Corporation. Fabricating a gallium phosphide device. 3,870,575, Cl. 148-171.000.

Dover Corporation: *See*—
Reece, Thomas L , 3,870,640.

Dow Chemical Company, The: *See*—
Wagner, Eugene R., 3,870,744.

Dowden, Samuel: *See*—
Goff, Jerry J., 3,870,339.

Dragoco Spezialfabrik konz. Riech-und Aromastoffe Gerberding & Co. GmbH: *See*—
Klein, Erich, 3,870,742.

Dravo Corporation: *See*—
Sellars, George L., 3,870,238.
Wright, Everald V., 3,870,010.

Dresser Industries, Inc.: *See*—
Winberg, Douglas F.; and Dyer, Norman D., 3,870,368.
Winberg, Douglas F.; and Dyer, Norman D., 3,870,370.

Dreyer, Charles W., to Omni Spectra, Inc. Abutting electrical contact means using resilient conductive material. 3,870,978, Cl. 333-97.00R.

Driendl, Heinrich. Device for indicating the static deformation of vehicle tires. 3,869,908, Cl. 73-146.200.

Driggers, Louis A. Tire chain holder and dispenser. 3,870,093, Cl. 152-213.000.

Driscoll, Robert R., to Pet Incorporated. Apparatus for preparing folded food chips. 3,869,971, Cl. 99-353.000.

Duckworth, Peter, to Keelavite Hydraulics Limited. Fluid flow control valves. 3,869,860, Cl. 60-371.000.

Dueker, James E.; and Brunkhorst, Lloyd E., to McDonnell Douglas Corporation. Optical image position indicator means using time and phase delay sensing. 3,870,887, Cl. 250-370.000.

Duffy, Donald E., to General Electric Company. Method for sensing surface displacement orthogonal to the direction of observation. 3,870,414, Cl. 356-109.000.

Duffy, James J.: *See*—
Golborn, Peter; and Duffy, James J., 3,870,771.

Dugger, William H.; and Alexander, Wayne K., to International Telephone and Telegraph Corporation. Depositing apparatus. 3,870,199, Cl. 222-189.000.

Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., to Nordson Corporation. Powder spray system. 3,870,375, Cl. 302-42.000.

Dunn, Allan R. U-shaped intravenous needle structure. 3,870,043, Cl. 128-214.00R.

Dunn, R. S. Awning structure, and method of assembly. 3,869,837, Cl. 52-75.000.

Dutkewych, Oleh Borys; and Hofmann, Lebert Arthur, to Shipley Company, Inc. Apparatus for dry replenishment of electroless plating solutions. 3,870,068, Cl. 137-268.000.

Dyer, Norman D.: *See*—
Winberg, Douglas F.; and Dyer, Norman D., 3,870,368.
Winberg, Douglas F.; and Dyer, Norman D., 3,870,370.

Dynamic Precision Controls Corporation: *See*—
Vanderbilt, Vern C., Jr.; Zimmer, Clarence L.; and Van Ostrand, William F., 3,870,972.

Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, 3,870,894.

Eagle, John Scott, to British Domestic Appliances Limited. Electric toasters. 3,869,970, Cl. 99-329.00R.

Eaton, Edward M. Coupling improvements. 3,870,332, Cl. 285-35.000.

Eberle, Arthur; and Spitzer, Nicholas A., to Columbia Gas System Service Corporation. Digital apparatus for the timing and analysis of internal combustion engines. 3,870,869, Cl. 235-92.0FQ.

Eberle, Jeannine A.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,870,728.

Eckerman, Keith F.: *See*—
Oltman, Billie G.; Eckerman, Keith F.; Romberg, Gerald P.; and Prepejchal, William, 3,869,918.

Ecodyne Corporation: *See*—
Luzaich, Samuel, 3,870,773.

Economics Laboratory, Inc.: *See*—
Mizuno, William G., 3,870,145.

Edds, Kenneth E.; Elbert, Donald L.; and Stone, Jerry F., to International Business Machines Corporation. Infrared and visible dual dye jet printer ink. 3,870,528, Cl. 106-22.000.

Edlund, Lars Anders; and Wikstrom, Berth Atle, to Berth Wikstrom AB. Electric heating and battery charging system for motor vehicle. 3,870,855, Cl. 219-202.000.

Edlund, Walter W. Self locking shelf table. 3,869,993, Cl. 108-101.000.

Edouard, Pierre Paul, to Lara S.A. Methods of and devices for continuously packaging articles in thermoshrinkable plastics film. 3,869,844, Cl. 53-30.000.

Egeland, Ole: *See—*
Skretting, Hans; and Egeland, Ole, 3,870,447.

Ehle, Joachim, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for effecting a close engagement between layers of sheet metal when making laminated pressure containers. 3,870,218, Cl. 228-4.000.

Eichenauer, Fritz: *See—*
Ohnmacht, Helmut, 3,870,863.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Schurle, Werner; and Muller, Anton, 3,870,094.

Elbert, Donald L.: *See—*
Edds, Kenneth E.; Elbert, Donald L.; and Stone, Jerry F., 3,870,528.

Elder, Boyd B., to Del Mar Engineering Laboratories. Exercise treadmill with inclination controlled chair mounted thereon. 3,870,297, Cl. 272-58.000.

Electricity Council, The: *See—*
Naybour, Robert Douglas; Farrell, Trevor; and Roberts, William Elwyn, 3,870,848.

Eli Lilly and Company: *See—*
Holmes, Richard E., 3,870,712.

Elkem-Skigerverket A/S: *See—*
Skretting, Hans; and Egeland, Ole, 3,870,447.

Ellen, Harry J. Automobile trunk mounted conveyor for handling heavy objects. 3,870,178, Cl. 214-450.000.

Elliott Brothers (London) Limited: *See—*
Tooze, Michael John; and Knight, Peter Michael, 3,870,938.

Elliott, Roderick Douglas, to Miles Laboratories, Inc. Insufflator. 3,870,046, Cl. 128-266.000.

Elliott-Williams Company, Inc.: *See—*
Thomas, John M., 3,869,873.

Ellis, Daniel A.: *See—*
Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,870,431.

Ellis, Joel F., to H. Fishlove & Company. Novelty and amusement device simulating an animal leash. 3,870,296, Cl. 272-8.00N.

Ellis, Leonard C.; and Kise, Mearl A., to Virginia Chemicals Inc. Process for the manufacture of N,N-diethyl-m-toluamide by aqueous caustic procedure. 3,870,756, Cl. 260-558.00A.

Ellis, Robert G., to Atlas Pacific Engineering Company. Machine for seed celling apples. 3,869,974, Cl. 99-547.000.

Ellis, Robert S.: *See—*
Deffenbaugh, James F.; Williams, Arthur L.; and Ellis, Robert S., 3,870,851.

Elton, Robert L.; and Vander Louw, John F., to Minnesota Mining and Manufacturing Company. Stretch-oriented porous films and preparation and use thereof. 3,870,593, Cl. 161-159.000.

Emerson Electric Co.: *See—*
Steiner, Robert E., 3,870,860.

Emley, Grace S.: *See—*
Hutchinson, Ronald R.; Emley, Grace S.; Hallin, Edward R.; and Murray, Nancy J., 3,870,794.

Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D., to Minnesota Mining and Manufacturing Company. Aldehyde condensation products of fluoraliphatic phenols. 3,870,682, Cl. 260-49.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Hindin, Saul G., 3,870,455.

Engineered Devices Company: *See—*
Roberts, Robert C; and Alcorn, Edward B., 3,870,825.

Engins Matra: *See—*
Robert, Michel, 3,870,939.

Engler, John R.; and Dompke, Ronald F. Track grit spreader apparatus. 3,870,352, Cl. 291-15.000.

English Electric Company Limited, The: *See—*
Hughes, Michael Alan, 3,870,926.
Hughes, Michael Alan, 3,870,927.

Epsex International, Inc.: *See—*
Blinkilde, Paul J., 3,870,120.

Erickson, Robert Edward: *See—*
Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,870,659.

Eriksson, Bolik Anders Gottfrid; Johansson, Erik Karl Gustav; and Vukotic, Milos, to Aktiebolaget Electrolux. Floor surface treating apparatus. 3,870,486, Cl. 55-276.000.

Ermal C. Fraze: *See—*
Brown, Omar L., 3,870,001.

Erskine, Donald Baldwin, to Calgon Corporation. Traveling filter for use with filter medium incineration process. 3,870,632, Cl. 210-67.000.

Erwin Sick Optik-Elektronik: *See—*
Walter, Arthur A. W.; and Langenbach, Erwin, 3,870,878.

ESB Incorporated: *See—*
Bergum, Bernard C.; and Oppedal, Tor, 3,870,566.

Esec Sales S. A.: *See—*
Nicklaus, Karl, 3,869,782.

Espen, David A., to Sperry Rand Corporation. Apparatus for compensating two axes gimbal error. 3,870,940, Cl. 318-633.000.

Estey Corporation: *See—*
Swart, Gary M., 3,870,260.

Etablissement Fresa: *See—*
Faucheux, Pierre, 3,870,122.

Ethyl Corporation: *See—*
Mitchell, Lawrence C.; and Ter Haar, Gary L., 3,870,679.

Etter, Berwyne E. Method and means of applying additives to industrial gas. 3,870,069, Cl. 137-209.000.

Eubanks, Edward F.; and Talley, Lloyd A., to Eubanks Engineering Co., by said Talley. Apparatus for attaching terminals to electric conductors. 3,869,781, Cl. 29-203.0DT.

Eubanks Engineering Co.: *See—*
Eubanks, Edward F.; and Talley, Lloyd A. (said Talley assors. to), 3,869,781.

Evans, George L.: *See—*
Warren, Bert; and Evans, George L., 3,870,601.

Evans, Russell S.: *See—*
Gibney, Kelly B.; Howard, John; and Evans, Russell S., 3,870,703.

Evequoz, Jean-Yves. Ski-bob. 3,870,329, Cl. 280-16.000.

Ex-Cell-O Corporation: *See—*
Schrader, William A.; and Schmidt, Joe, 3,870,249.

Exertier, Jean-Yves: *See—*
Merigoux, Henri; Darces, Jean-Francois; and Exertier, Jean-Yves, 3,870,880.

Exxon Research and Engineering Company: *See—*
Arnold, George T.; Hochman, Jack M.; and Pennington, Robert E., 3,870,621.
Makowski, Henry S.; Lundberg, Robert D.; and Singhal, Gopal H., 3,870,841.
Moss, Gerald, 3,870,480.
Patton, Tad L., 3,870,692.

Fa. Kleinewefers Industrie-Companie GmbH: *See—*
Schiffer, Gunther, 3,870,215.

Fajans, Jack; and Nankivell, John E., to Gravicon Corporation. Apparatus for measuring paper stock consistency. 3,869,922, Cl. 73-438.000.

Falkehag, Sten I.; and Bailey, Carl W., III, to Westvaco Corporation. Mofiefied sulfonated resin surfactants. 3,870,681, Cl. 260-49.000.

Falkenberg, Dieter: *See—*
Oesterhelt, Gerhard; Winkler, Josef; Falkenberg, Dieter; and de Bucs, Eugen Szabo, 3,870,568.

Fantechi, Guiliano: *See—*
Brandigi, Carlo; and Fantechi, Guiliano, 3,869,966.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Jager, Gerhard; Plempel, Manfred; and Buchel, Karl Heinz, 3,870,726.

Farha, Floyd E., Jr.: *See—*
Gichowski, Robert S.; and Farha, Floyd E., Jr., 3,870,764.

Farrauto, Robert J.; Hoekstra, Karl E.; and Shoup, Robert D., to Corning Glass Works. Copper chromite-alumina catalysts having high-temperature stability. 3,870,658, Cl. 252-465.000.

Farrell, Trevor: *See—*
Naybour, Robert Douglas; Farrell, Trevor; and Roberts, William Elwyn, 3,870,848.

Farrissey, William J., Jr.; and Rausch, Karl W., Jr., to Upjohn Company, The. Particulate polyimide compositions containing phenal or dipolar aprotic solvents. 3,870,674, Cl. 260-30.200.

Farrissey, William J., Jr.; and Andrews, Philip S. Heat resistant reinforced composites of copolyimides. 3,870,677, Cl. 260-37.00N.

Fasco Industries, Inc.: *See—*
Hire, Charles John, 3,870,985.

Fass, Leonard; and Fatuzzo, Ennio, to Minnesota Mining and Manufacturing Company. System formed by the combination of a solid state image intensifier and a compatible adapted x-ray film. 3,870,892, Cl. 250-483.000.

Fassell, W. Martin; and Bridges, Donald W., to Barber-Colman Company. Apparatus and method for wet oxidation of organic matter. 3,870,631, Cl. 210-63.000.

Fathauer, George H., to Decatur Electronics, Inc. Vehicle presence detector. 3,870,990, Cl. 340-38.00L.

Fatuzzo, Ennio: *See—*
Fass, Leonard; and Fatuzzo, Ennio, 3,870,892.

Faucheux, Pierre, to Etablissement Fresa. Service device. 3,870,122, Cl. 182-36.000.

Faulkner, Raymond Noel, to Research Corporation. Resinous reaction product of a sucrose partial ester, a cyclic dicarboxylic acid anhydride and a diepoxide. 3,870,664, Cl. 260-9.000.

Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. Derivatives of 4'-aminomethyl-dibenzo (B,E)-11-oxepine-2'-spiro-1',3'-dioxolane, their method of preparation and their therapeutic application. 3,870,728, Cl. 260-340.900.

Faylor, Terry Lee; and Martin, Roger W., to Aqua Media. Ultra pure water process and apparatus. 3,870,033, Cl. 126-360.00R.

Federal-Mogul Corporation: *See—*
Ladin, Eli M., 3,870,384.

Feeman, James F., to Crompton & Knowles Corporation. Benzthiazole-azo-(4-n-sulfopropyl)phenyl compounds. 3,870,696, Cl. 260-158.000.

Feinberg, Irvin, to Presto Lock Company. Garment hanger frame having a hinged hook. 3,870,206, Cl. 223-88.000.

Fels, Werner, to Dr. Ing Rudolf Hell GmbH. Method of transferring photographic film between cassette and an exposure drum. 3,870,518, Cl. 96-27.00R.

Ferguson, William C., to J. Wiss & Sons Co. Latch for hand tool. 3,869,793, Cl. 30-262.000.

Ferranti Limited: *See—*
Jackson, Sydney; and Titterington, Joseph Bell, 3,871,018.

Ferri, John L.; and Mathers, James E., to GTE Sylvania Incorporated. Europium-activated-rare earth oxide phosphors. 3,870,650, Cl. 252-301.40R.

Ferro-Carb Agglomeration Ltd., Inc.: *See*—
Allen, John E., 3,870,507.
Allen, John E., 3,870,509.
Ferro Corporation: *See*—
Roberts, Gordon J., 3,870,530.
Fields, Leslie L. Method and apparatus for measuring the dwell and rpm of an engine. 3,870,947, Cl. 324-16.00R.
Fieser, Arthur H.; and Mobley, Loreley S. Method for conditioning metal slabs. 3,870,570, Cl. 148-9.500.
Filatov, Andrei Dmitrievich: *See*—
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Filip, Stanislaw F., to I.C.S. Ignition Control Systems Ltd. Cable activated switch. 3,870,846, Cl. 200-161.000.
Filz, William F., to North Pacific Canners & Packers, Inc. Two stage interior-exterior blanching process. 3,870,813, Cl. 426-509.000.
Findeva AG: *See*—
Fink, Willy, 3,870,281.
Fineman, Howard Eisen: *See*—
Hanson, Richard Eric; and Fineman, Howard Eisen, 3,870,954.
Fink, Herbert; Munzer, Manfred; and Dinklage, Horst, to Rohm GmbH. Treatment of porous web structures with aqueous suspensions of a synthetic resin. 3,870,557, Cl. 117-161.00R.
Fink, Werner: *See*—
Belart, Juan; Fink, Werner; Kircher, Dieter; and Von Grunberg, Hubertus, 3,870,377.
Fink, Willy, to Findeva AG. Compressed air vibrator. 3,870,281, Cl. 259-1.00R.
Finke, Harry P.; Carr, Hugh B.; and Wilson, Carl D. Three lever valve with relief port. 3,870,079, Cl. 137-630.140.
Fiore, John M., to Bio-Analytical Laboratories, Inc. Improved speculum barrel member. 3,870,036, Cl. 128-6.000.
Firth, Anthony Christopher; and Child, Robin Edward, to Automotive Products Company Limited. Internal shoe drum brakes. 3,870,131, Cl. 188-325.000.
Firtion, Victor Andrew: *See*—
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,870,416.
Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Cultivation of plants in greenhouses. 3,869,826, Cl. 47-17.000.
Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Herbicide. 3,870,502, Cl. 71-92.000.
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted O-(aminosulfonyl)-glycolic anilides. 3,870,740, Cl. 260-456.00A.
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., to Union Oil Company of California. Low fluid loss additive composition. 3,870,668, Cl. 260-28.50R.
Fisher, Leslie George: *See*—
Davies, John Hazlewood; Palmer, Bertram Joseph; and Fisher, Leslie George, 3,869,878.
Flach, Karl-Egon: *See*—
Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, 3,870,894.
Fletcher, Peter C., to Speed Selector, Inc. Spring biased double acting expansible pulley with increased spring fatigue life. 3,869,932, Cl. 74-230.17R.
Flint, Alan G., to GCA Corporation. Single or multi-track fluid bearing heating apparatus and method. 3,870,460, Cl. 432-11.000.
Flueckiger, Noah: *See*—
Holt, Frederick R.; and Flueckiger, Noah, 3,870,948.
Flygare, Willis H.; and Ware, Bennie R., to University of Illinois Foundation. Analysis for polymer mixtures in solution utilizing electrophoretic light scattering apparatus. 3,870,612, Cl. 204-180.00R.
FMC Corporation: *See*—
Hall, Richard E.; and Bhalla, Sushil K., 3,870,783.
Fohlisch, Wolfgang: *See*—
Doschko, Werner; Fohlisch, Wolfgang; and Wensch, Alfred, 3,869,853.
Fonio, Mario. Clamp device for laying-up machines suitable to keep each layer of fabric during its laying-up. 3,870,291, Cl. 270-31.000.
Forest, Edmond, to Societe Anonyme: Reveils Bayard. Step-by-step device for a ratchet-wheel. 3,869,930, Cl. 74-128.000.
Forest Laboratories, Inc.: *See*—
Lowey, Hans; and Stafford, Herbert Henry, 3,870,790.
Fortuna-Werke Maschinenfabrik Aktiengesellschaft: *See*—
Braun, Dieter, 3,869,745.
Foseco International Limited: *See*—
Hawthorne, Peter Frederick, 3,870,595.
Foster, Edwin E. Bracket for a spring sash counterbalance. 3,869,754, Cl. 16-197.000.
Fougere, Guy L., to Arthur D. Little, Inc. Method and apparatus for coin selection utilizing inductive sensors. 3,870,137, Cl. 194-100.00A.
Foundation for Behavioral Research: *See*—
Hutchinson, Ronald R.; Emley, Grace S.; Hallin, Edward R.; and Murray, Nancy J., 3,870,794.
Franck, Jean-Pierre: *See*—
Torck, Bernard; Derrien, Michel; and Franck, Jean-Pierre, 3,870,653.
Frank, Karl. Apparatus for the production of an article from thermoplastic synthetic plastic, using blowing, injection and blowing or foil blowing process. 3,870,452, Cl. 425-387.00B.
Frankenberg, Henry E., to Continental Can Company, Inc. Aerosol dispensing valve. 3,870,203, Cl. 222-397.000.
Franklin, Harold J. Hot grease guard for cooking utensil. 3,870,191, Cl. 220-370.000.
Frederiksen, Thomas M., to Motorola, Inc. Current mode operational amplifier. 3,870,965, Cl. 330-30.00R.
Fredrickson, John M. Implantable electromagnetic hearing aid. 3,870,832, Cl. 179-107.00E.
Freeman Supply Company, The: *See*—
Rusk, Gerald; and Koch, Robert E., 3,870,092.
Frei, Ephraim H.; Yerushalmi, Shmuel; and Benmair, Yusuf, to Yeda Research & Development Co. Ltd. Ferromagnetic compositions of matter. 3,870,645, Cl. 252-62.560.
Freure, Robert J.; and Moyle, Maurice, to Gulf Oil Canada Limited. Light stable polyurethanes based on dicyclohexyl and diisocyanates. 3,870,683, Cl. 260-75.0NT.
Frid. Krupp Gesellschaft mit Beschrankter Hoftung: *See*—
Schatz, Oskar, 3,870,443.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Ehle, Joachim, 3,870,218.
Muller, Peter, 3,869,851.
Friederang, Albrecht: *See*—
Pasedach, Heinrich; and Friederang, Albrecht, 3,870,761.
Friend, George R. Vehicle frame alignment gage. 3,869,804, Cl. 33-288.000.
Friesen, Dale M.; and Nordeen, Erwin E., to Whirlpool Corporation. Means for removably connecting a dirt collecting receptacle in a vacuum cleaner. 3,870,491, Cl. 55-376.000.
Froehlich, Alfred; and Loeffel, Hansrolf, to Ciba-Geigy AG. Trisazo dyestuffs containing two carboxamide groups. 3,870,697, Cl. 260-173.000.
Froman, Seymour; and Chandler, William L., to California Laboratory Industries, Inc. Gas permeable sterile culture bottle. 3,870,602, Cl. 195-139.000.
Fruchtnicht, Ernst August. Fish growing tank. 3,870,018, Cl. 119-3.000.
Frymaster Corporation, The: *See*—
Price, George M., 3,870,859.
Fuchs, Thomas D.; and Micka, John J., to Owens-Illinois Inc. Easy open metal closure. 3,870,184, Cl. 215-255.000.
Fuji Oil Company, Ltd.: *See*—
Kubota, Hayato; Nakayama, Sadao; and Tateishi, Teizaburo, 3,870,733.
Fuji Photo Film Co., Ltd.: *See*—
Ikenoue, Shinpei; and Masuda, Takao, 3,870,523.
Kubotera, Kikuo; Ikenoue, Shinpei; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,870,479.
Shimamura, Isao; Shishido, Tadao; Ohi, Reiichi; and Iwano, Haruhiko, 3,870,520.
Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, 3,870,524.
Yamamoto, Nobuo; Kawaguchi, Hideo; and Furukawa, Katsuharu, 3,870,525.
Fujii, Toru: *See*—
Yamashita, Nobuo; and Fujii, Toru, 3,870,400.
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, to Takeda Chemical Industries, Ltd. Peptide synthesis with n-hydroxy-5-norbornene-2,3-dicarboximide. 3,870,694, Cl. 260-112.500.
Fujiwara, Tadahiro: *See*—
Kubotera, Kikuo; Ikenoue, Shinpei; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,870,479.
Fukuda, Tsunehiko: *See*—
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,870,694.
Fukui, Shoshin: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.
Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Bridge top stop for slide fasteners. 3,869,765, Cl. 24-205.11F.
Fulmini, Sergio: *See*—
Siclari, Francesco; Maderno, Cesano; Magnoni, Franco; and Fulmini, Sergio, 3,870,475.
Fumitake Yoshida: *See*—
Yoshida, Fumitake; and Ohshima, Norio, 3,870,470.
Furuichi, Eiichi: *See*—
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.
Furukawa, Katsuharu: *See*—
Yamamoto, Nobuo; Kawaguchi, Hideo; and Furukawa, Katsuharu, 3,870,525.
Fussner, Paul, to Robert Bosch GmbH. Electric motor pump unit. 3,870,910, Cl. 310-66.000.
G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken: *See*—
Dannenmann, Paul; and Kratz, Gunter, 3,870,438.
G. S. Blakeslee Co.: *See*—
Janiszewski, Casimer, 3,870,067.
Gabor, Andrew, to Potter Instrument Company, Inc. Decoder for high density decoding system. 3,870,870, Cl. 235-92.0MB.

Gabor, Dennis, to Columbia Broadcasting System, Inc. Ultrasonic cameras. 3,869,904, Cl. 73-67.50H.
Gabriel of Canada Limited: *See—*
Miller, Gerald R., 3,870,130.
GAF Corporation: *See—*
Grifo, Richard Anthony, 3,870,648.
Mackey, E. Scudder; Pechmann, Karl; and Tritten, Donald E., 3,870,521.
Peterson, William R.; and Johnson, Walter N., 3,870,770.
Randall, David I.; and Wynn, Robert W., 3,870,772.
Ruygrok, Albertus Pieter, 3,870,549.
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, to Ciba-Geigy Corporation. Certain 6-phenyl-4h-s-triazolo[1,5-a][1,4]benzodiazepine-2-carboxamides. 3,870,714, Cl. 260-247.5EP.
Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,870,706.
Gakken Co. Ltd.: *See—*
Hatano, Fukuji; and Kobayashi, Yukio, 3,870,330.
Gale, William F.; and Thompson, James Douglas, to said James Douglas Thompson to said William F. Gale. Ladder and mounting for small boats. 3,869,742, Cl. 9-1.00R.
Gallant, James O.; Staples, Robert E.; and Knapp, George P., to Mount Hope Machine Company, Incorporated. Fluid bearing table roll. 3,869,774, Cl. 29-116.0AD.
Galloway, John D. Storage rack for wine bottles. 3,870,155, Cl. 211-74.000.
Gallus, Julius P.: *See—*
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 3,870,668.
Garber, John L.: *See—*
Garber, John R.; and Garber, John L., 3,869,983.
Garber, John R.; and Garber, John L. Variable repeat-length web printing press. 3,869,983, Cl. 101-137.000.
Gardent, Maurice; Michalak, Wadislaw; and Prost, Roger, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for tempering glass. 3,869,876, Cl. 62-376.000.
Garvey, Glenwood L.; and Begley, Richard J., to Self-Cleaning Environments. Self-cleaning restroom. 3,869,732, Cl. 4-1.000.
Gassmann, Horst: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.
Gates Rubber Company, The: *See—*
Rohlfing, Raymond A., 3,870,478.
Gavin, Joseph H.: *See—*
Arndt, Frederick W.; and Gavin, Joseph H., 3,870,488.
Gawlick, Heinz: *See—*
Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, 3,870,894.
Gayler, Winston D.; and Ahern, James E., to Vidar Corporation. Telephone exchange metering system. 3,870,823, Cl. 179-7.0MM.
GCA Corporation: *See—*
Flint, Alan G., 3,870,460.
Larson, Paul E., 3,870,882.
Gebr. Cramer, Firma: *See—*
Kruper, Aloys, 3,870,031.
Gebruder Seidel KG: *See—*
Reinhard, Willy, 3,870,186.
Gedwill, Michael A.; and Grisaffe, Salvatore J., to United States of America, National Aeronautics and Space Administration. Duplex aluminized coatings. 3,869,779, Cl. 29-194.000.
Gegner, Eberhard, to British Petroleum Company Limited, The. Grease thickened with oxygen-linked polyureas. 3,870,642, Cl. 252-51.50A.
Gehlhoff, Leo F.: *See—*
Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D., 3,870,682.
Gelsomino, Fred J., to National Gypsum Company. Asbestos-cement product and process. 3,870,546, Cl. 117-72.000.
Gemmel, John F.; and Brown, Charles C. Practice weight for ice skates. 3,870,328, Cl. 280-11.37E.
General Electric Company: *See—*
Busby, Llewellyn D., 3,869,816.
Catherino, Henry A., 3,870,562.
Clark, Burton Parker, 3,869,960.
Debesis, John R., 3,871,008.
Debesis, John R., 3,871,016.
Dempsey, Russell M.; Nolan, Mary E.; La Conti, Anthony B.; and Torkildsen, Robert A., 3,870,616.
Duffy, Donald E., 3,870,414.
Hellman, Wayne R.; Gottschalk, Klaus; and De George, Edward C., 3,870,919.
Hill, Robert L.; and Ringeman, Othmar E., 3,870,393.
Hoffman, Orville William, 3,870,907.
Pangburn, William Walrath, 3,870,909.
Paulson, Elmir Edward, 3,870,434.
Pedersen, Niels P.; and Shabel, John M., 3,870,945.
Schimke, Thomas O., 3,870,858.
Zuercher, Edward A., Jr., 3,870,440.
General Foods Corporation: *See—*
Capossela, Anthony C.; McGuire, Michael T.; Smith, Gordon C.; and Albaum, Joseph D., 3,870,806.
Hayes, John T., Jr.; and Marshall, William E., 3,870,812.
Siems, Ruth M.; Capossela, Anthony C., Jr.; Halligan, John F.; and Wyss, C. Robert, 3,870,803.
General Instrument Corporation: *See—*
Smith, Kent F.; and Huber, Robert J., 3,870,901.
General Motors Corporation: *See—*
Thornburgh, William F., 3,869,859.
General Signal Corporation: *See—*
Sibley, Henry C., 3,870,952.
General Tire & Rubber Company, The: *See—*
Stringfellow, Jerry D., 3,870,449.
geobra Brandstatter GmbH & Co. KG: *See—*
Brandstatter, Horst, 3,870,864.
Georgi, Walter L., to Palspros, Inc. Safety cap for threaded closure. 3,870,182, Cl. 215-220.000.
German, Sidney. Web cuting sewing machine and process. 3,869,997, Cl. 112-121.120.
Gernetzke, David W. Apparatus for removing articles from envelopes. 3,870,176, Cl. 214-308.000.
Gervais-Danone AG: *See—*
Schulz, Max Erich, 3,870,811.
Geschafts-und Industriebau B. Moeller & Co.: *See—*
Moeller, Bonde, 3,870,159.
Getman, Darryl L.; and Swenson, Marshall G., to Beloit Corporation. Drainage foil having a foil blade insert. 3,870,597, Cl. 162-352.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Lobbe, Armin, 3,870,369.
Gezari, Walter A., to International Telephone and Telegraph Corporation. Pipe fitting closure. 3,870,084, Cl. 138-89.000.
Gibb, John F., to Backer Rod Mfg. & Supply Co. Flexible foam material shaper. 3,869,831, Cl. 51-75.000.
Gibney, Kelly B.; Howard, John; and Evans, Russell S., to Canadian Cellulose Company, Limited. Production of cellulose esters. 3,870,703, Cl. 260-229.000.
Gichowski, Robert S.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Oxidative dehydrogenation process. 3,870,764, Cl. 260-680.00E.
Gidge, Lester, to Terra-Tex Corporation. Pre-formed, mulch carpet and apparatus and method for making same. 3,870,583, Cl. 156-500.000.
Gilles, Martin; and Thiel, Anton, to Clouth Gummiwerke AG. Casing for track-laying and wheel-equipped vehicles. 3,870,337, Cl. 280-154.50R.
Gillette Company, The: *See—*
Pirner, Hans G., 3,869,802.
Ginnow, Oscar H.; and Ginnow, Roger H. Unnailer. 3,869,780, Cl. 29-200.00D.
Ginnow, Roger H.: *See—*
Ginnow, Oscar H.; and Ginnow, Roger H., 3,869,780.
Givaudon Corporation: *See—*
Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,870,659.
GKN Transmission Limited: *See—*
Webb, Oswald; and Pagdin, Brian Colin, 3,869,940.
GKN Transmissions Limited: *See—*
Davies, John Hazlewood; Palmer, Bertram Joseph; and Fisher, Leslie George, 3,869,878.
Glaser, Heinz; and Zlatareff, Vassil, to Societe d'Etudes du Procede Noridem. Temporary printing carriers. 3,870,539, Cl. 117-3.100.
Glass, Marvin I.: *See—*
Meyer, Burton C.; and Glass, Marvin I., 3,870,307.
Gneiding, Albert, to Belras AG. Abrasion disk for soap dispensers. 3,869,773, Cl. 29-78.000.
Goebel, Joseph, to Addressograph Multigraph Corporation. Microfiche drive assembly and transport assembly. 3,870,413, Cl. 355-53.000.
Goebel, Joseph: *See—*
Patzke, Robert C.; and Goebel, Joseph, 3,870,981.
Goff, Jerry J., to Dowden, Samuel, a part interest. Multi-purpose tandem trailer. 3,870,339, Cl. 280-414.00R.
Gokcen, Cem M., to Beloit Corporation. Apparatus for extruding foamed thermoplastic material. 3,870,451, Cl. 425-378.00R.
Golborn, Peter; and Duffy, James J., to Hooker Chemical & Plastics Corporation. Dialkyl alkyl and aromatic sulfonamidomethyl phosphonates. 3,870,771, Cl. 260-944.000.
Goldner, Sandor: *See—*
Lax, Jacob; and Goldner, Sandor, 3,870,895.
Gondek, John T. Planetary gear pump. 3,870,437, Cl. 417-310.000.
Gonsales, Rodriges Sesar: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.
Gonser, Donald I., to Dentsply Research and Development Corporation. Electrosurgical device. 3,870,047, Cl. 128-303.140.
Gonzalez, Luis A.: *See—*
Ashton, William B.; Gonzalez, Luis A.; Nelson, Gerald V.; and Mead, Theodore C., 3,870,622.
Gooch, James Bartley. Decorative fire extinguisher. 3,870,105, Cl. 169-33.000.
Goodrich-Gulf Chemicals, Inc.: *See—*
Harpell, Gary Allan, 3,870,678.
Goodyear Tire & Rubber Company, The: *See—*
Dorf, Marvin L., 3,869,933.
Hutchings, David A., 3,870,731.
Kuhn, George B., 3,870,741.

Gordon, Wolfgang; Rust, Kurt; and Schrott, Erwin, to Hoechst Aktiengesellschaft. Process for the polymerization of alpha-olefins. 3,870,690, Cl. 260-88.20R.

Gorham International Inc.: *See—*
Sawyer, Willard C., 3,869,808.

Gorman-Rupp Company, The: *See—*
Remy, Dennis K., 3,870,436.

Gorski, Walter, to Textron Inc.,. Guide bar oiling system for chain saw. 3,870,125, Cl. 184-15.00R.

Gosling, Alexander Bennett: *See—*
Smith, Colin Howard Stanwell; Gosling, Alexander Bennett; and Buchanan, Donald George, 3,870,321.

Gosling, William Robert Frederick; Wakefield, David John; and Long, Terry. Supporting linkage arrangement for earth working tool. 3,870,106, Cl. 172-239.000.

Goss, John B.: *See—*
Stachowiak, John E.; and Goss, John B., 3,870,439.

Gosse, Francoise, to Societe En Commandite Par Actions: Etablissements M. Caulliez Et Delaoutre. Device for making radially extending motifs of textile fibers. 3,870,207, Cl. 223-46.000.

Goto, Kenji; Mitsui, Ryozo; and Ishikawa, Norikatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying system for motor vehicles. 3,869,858, Cl. 60-290.000.

Goto, Teruo: *See—*
Makimura, Osamu; and Goto, Teruo, 3,870,688.

Gottschalk, Klaus: *See—*
Hellman, Wayne R.; Gottschalk, Klaus; and De George, Edward C., 3,870,919.

Graat, Johannes W., to Smit Nymegen B.V. Burner for the stoichiometric combustion. 3,870,456, Cl. 431-8.000.

Graebe, Robert H. Multicelled structure apparatus for making same. 3,870,450, Cl. 425-269.000.

Graham, Donald E.; and Battaglia, Larry A., to Valve Systems International, Inc. Swing check seal assembly. 3,870,071, Cl. 137-527.000.

Graubremse GmbH: *See—*
Nicolay, Heinz; and Gruner, Hans, 3,870,128.

Gravicon Corporation: *See—*
Fajans, Jack; and Nankivell, John E., 3,869,922.

Gray, Benjamin C. Hydraulic drilling or servicing rig. 3,870,109, Cl. 173-38.000.

Gray, David Antony: *See—*
Robinson, Michael; Wilson, Harry Brian; and Gray, David Antony, 3,870,506.

Graznak, Charles, to Dacmont, Inc. Automatic liquid medicament mixer for treating animals. 3,870,076, Cl. 137-607.000.

Greatbatch, Wilson. Demand pacer. 3,870,050, Cl. 128-419.0PG.

Green, Brian Noel: *See—*
Halliday, John Stephen; and Green, Brian Noel, 3,870,881.

Green, Glen R.; and Bennion, Jay B., to Ore-Ida Foods, Inc. Steaming caustic treated, peeled potatoes to loosen and remove the eyes and defect portions thereof. 3,870,809, Cl. 426-287.000.

Greenfield, Walter; and Berg, Raymond, to Sci-Med Laboratories, Inc. Wright's stain packet. 3,870,146, Cl. 206-84.000.

Greenshields, James Nairn: *See—*
Cowling, Ronald; and Greenshields, James Nairn, 3,870,559.

Grifo, Richard Anthony, to GAF Corporation. Polyelectrolytes as detergent builders. 3,870,648, Cl. 252-135.000.

Grimaud, Edouard; and Tournut, Claude, to Pechiney Ugine Kuhlmann. Method for polymerizing tetrafluoroethylene and the polymers obtained therefrom. 3,870,691, Cl. 260-92.100.

Grimaud, Edouard; and Troussier, Maurice, to Pechiney Ugine Kuhlmann. Oleophobic and hydrophobic polymers containing polymerization product of fluorinated sulfonamideoethylene moieties. 3,870,767, Cl. 260-836.000.

Grisaffe, Salvatore J.: *See—*
Gedwill, Michael A.; and Grisaffe, Salvatore J., 3,869,779.

Grisar, J. Martin; and Claxton, George P., to Richardson-Merrell Inc. 2-Azacycloalkylmethyl substituted benzhydryl ketones and carbinols. 3,870,723, Cl. 260-293.800.

Groce, Raymond; and Kussemaul, Ernest A., to Loveshaw Corporation, The. Variable rate pulse generating system. 3,870,963, Cl. 328-59.000.

Grolig, Johann: *See—*
Scharfe, Gerhard; and Grolig, Johann, 3,870,730.

Gross, Alexander. Chenille production machines. 3,869,850, Cl. 57-24.000.

Gruber, Alan H.: *See—*
Ohlstein, Herbert; and Gruber, Alan H., 3,870,974.

Gruner, Hans: *See—*
Nicolay, Heinz; and Gruner, Hans, 3,870,128.

Grunin, Lev Petrovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.

Gruszecki, Wojciech; Taszer, Emil; and Borowski, Edward, to Politechnika Gdanska Instytut Chemii i Technologii Organicznej Oraz Zywnosciowej. Amine derivatives of penicillins and the method of their production. 3,870,708, Cl. 260-239.100.

GTE Sylvania Incorporated: *See—*
Ferri, John L.; and Mathers, James E., 3,870,650.
Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., 3,869,772.

Guenot, Rene, to Regie Nationale Des Usines Renault. Arrangement for the detection, with a rocking feeler, of the presence of a part. 3,870,430, Cl. 408-6.000.

Guild, Lloyd V. Apparatus for collecting samples of contaminants. 3,870,492, Cl. 55-387.000.

Gulf Oil Canada Limited: *See—*
Freure, Robert J.; and Moyle, Maurice, 3,870,683.

Gulf Research & Development Company: *See—*
Onopchenko, Anatoli; and Schulz, Johann G. D., 3,870,734.
Paviak, Stanley C., 3,870,660.
Plundo, Robert A.; Readal, Thomas C.; and Strom, James R., 3,870,626.
Tabacek, Joseph A.; Taylor, Brian W.; and Vogel, Roger F., 3,870,545.

Gulf & Western Industrial Products Company: *See—*
Lose, John G.; and Roth, John F., 3,869,927.

Guptill, Joel P., to Allied Chemical Corporation. Purification of sodium carbonate. 3,870,780, Cl. 423-206.000.

Gussak, Lev Abramovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

H. Fishlove & Company: *See—*
Ellis, Joel F., 3,870,296.

H. W. Hart Mfg. Co.: *See—*
Hart, Harold W., 3,870,022.

Haase, Harold A. Work transfer device. 3,870,164, Cl. 214-1.0BB.

Hackett, Charles F.: *See—*
Smith, Michael; Hackett, Charles F.; and Radler, Richard W., 3,870,516.

Hackhel, Robert H. Pressure-sensitive adhesive tape. 3,870,552, Cl. 117-122.0PF.

Haddad, Heskel M.; and Loucas, Spiro P. Solid state ophthalmic medication delivery method. 3,870,791, Cl. 424-22.000.

Hagstrom, Robert G.: *See—*
Whitten, Charles M.; and Hagstrom, Robert G., 3,870,652.

Hale, Richard W.; Tan, Patrick; Stowell, Richard C.; and Ordway, Donald E., to Sage Action Inc. Gas flow visualization system and control apparatus. 3,869,909, Cl. 73-147.000.

Haley, Chester J., to Northwest Molded Products Corp. Self-locking dispenser. 3,870,192, Cl. 221-86.000.

Hall, Melvin R.: *See—*
Boatman, Roger M.; and Hall, Melvin R., 3,870,953.

Hall, Richard E.; and Bhalla, Sushil K., to FMC Corporation. Process of preparing sodium carbonate peroxide. 3,870,783, Cl. 423-415.000.

Hallford, Ben R.; and Wright, Charles H., to Rockwell International Corporation. Mixer carrier null adjustment. 3,870,960, Cl. 325-446.000.

Halliday, John Stephen; and Green, Brian Noel, to Associated Electric Industries. Method of analyzing output signals representing the mass spectrum from a scanning mass spectrometer. 3,870,881, Cl. 250-283.000.

Halligan, John F.: *See—*
Siems, Ruth M.; Capossela, Anthony C., Jr.; Halligan, John F.; and Wyss, C. Robert, 3,870,803.

Hallin, Edward R.: *See—*
Hutchinson, Ronald R.; Emley, Grace S.; Hallin, Edward R.; and Murray, Nancy J., 3,870,794.

Hallsenius, Carlgustaf, administrator: *See—*
Pulk, Elgas, deceased; and Noren, John Paul, 3,870,114.

Halpern, John W. Fee charging system. 3,870,866, Cl. 235-61.70R.

Hamana, Isao: *See—*
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi, 3,870,637.

Hamanaka, Ernest S., to Pfizer Inc. 6-(Alpha-(ome ga-guanidinoalkanoylamido)acylamido)penicillanic acids. 3,870,709, Cl. 260-239.100.

Hamanaka, Ernest S., to Pfizer Inc. Phosphono substituted alkylcephalosporins. 3,870,713, Cl. 260-243.00C.

Hamann, Herman C.: *See—*
Clemens, David H.; and Hamann, Herman C., 3,870,663.

Hamar, Douglas A. Game. 3,870,312, Cl. 273-135.00F.

Hamel, Edmund, to Die Evolution S.A. Method of and apparatus for twisting yarn. 3,869,852, Cl. 57-59.000.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Web of record members. 3,870,867, Cl. 235-61.12R.

Hammermill Paper Company: *See—*
Butler, Ralph R., 3,870,222.

Hampel, Uwe: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.

Hamprecht, Gerhard: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,870,740.

Hancy, Raymond E. Teaching device for forming intelligence characters. 3,869,813, Cl. 35-37.000.

Hanley, John J., to Lawrence Peska Associates, Inc. Portable travel bag. 3,870,132, Cl. 190-52.000.

Hanna, Drexel W., Jr., to All Systems. Radar system. 3,870,992, Cl. 343-5.0DP.

Hanser, Paul Edmund; and Snyder, William Lee, to Deere & Company. Valve for controlling a reversible, rotary hydraulic motor. 3,870,074, Cl. 137-596.160.

Hansl, Nikolaus R. Substituted amino ethyl meta benzoic acid esters. 3,870,715, Cl. 260-247.20B.

Hanson, Brian D.: *See*—
Wilson, David G.; Hanson, Brian D.; and Malarkey, John M., 3,870,127.

Hanson, Henry Lloyd. Display card and frangibly separable container. 3,870,144, Cl. 206-45.140.

Hanson, Richard Eric; and Fineman, Howard Eisen, to RCA Corporation. Starter system fault detector. 3,870,954, Cl. 324-158.0MG.

Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reboundless focal plane shutter. 3,871,012, Cl. 354-246.000.

Harbor Universal, Inc.: *See*—
Mortashed, Merle H., 3,870,387.

Harburger, Oelwerke, Brinckman & Mergell: *See*—
Baltes, Josef, 3,870,807.

Harclerode, Thomas J. Light ray gun and target including elapsed time counter. 3,870,305, Cl. 273-101.100.

Hardiman, Russell J.; Leiter, Leigh David; and Valle, Howard C., to Ametek, Inc. Self-erecting pod. 3,870,263, Cl. 248-168.000.

Harding Development Company: *See*—
Hawk, Gary D., 3,870,420.

Hargraves, Don, to Laurier Associates, Inc. High yield method of breaking wafer into dice. 3,870,196, Cl. 225-1.000.

Harpell, Gary Allan, to Goodrich-Gulf Chemicals, Inc. Reaction product of an organometallic compound and an organic nitro compound as an antioxidant for conjugated diolefin polymers. 3,870,678, Cl. 260-45.90R.

Harper, Robert A., Jr.: *See*—
Wentzel, Warren W., Jr.; and Harper, Robert A., Jr., 3,870,374.

Harris, Alva F.; and Shapras, Peter, to Monsanto Company. Packaging nitrile containing resins. 3,870,802, Cl. 426-106.000.

Harriss-Conners Chevrolet, Inc.: *See*—
Atwater, William M., 3,869,832.

Hart, Dennis Edward: *See*—
Baxter, Roderick Carey; and Hart, Dennis Edward, 3,870,979.

Hart, Harold W., to H. W. Hart Mfg. Co. Poultry watering device. 3,870,022, Cl. 119-75.000.

Harter Corporation: *See*—
Bowman, Gary L., 3,870,271.
Holtz, Richard L., 3,870,270.

Hartman, John R.; and Summerlin, Dorsey. Foldable hat. 3,869,727, Cl. 2-175.000.

Hartmann, Helmut: *See*—
Stein, Werner; and Hartmann, Helmut, 3,870,735.

Hase, Hideonori, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile exhaust arrangement. 3,870,115, Cl. 180-5.00R.

Hasegawa, Eiichi: *See*—
Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, 3,870,524.

Hasfjord, Morten Birger, to Svenska Industrietablerings AB (Svetab) Swedish Industrial Establishing Corporation. Arrangement in planing machines with feeding mechanism comprising at least two rollers. 3,870,090, Cl. 144-249.00R.

Hashimoto, Masami. Stabilizing device for buoyant body. 3,870,006, Cl. 114-121.000.

Hashitani, Motoyoshi: *See*—
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Hastings, Donald R.: *See*—
Wilhelm, Frederick R.; Hastings, Donald R.; and Lyth, William W., 3,870,233.

Hatano, Fukuji; and Kobayashi, Yukio, to Gakken Co. Ltd. Snow scooters. 3,870,330, Cl. 280-16.000.

Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, to Hitachi, Ltd. Digital circuit. 3,870,897, Cl. 307-208.000.

Haubenestel, Kenneth C. Coupling system relating especially to conduit fittings, electrical boxes or special fittings for other applications. 3,870,347, Cl. 285-156.000.

Haubold, Heinz-Gunther: *See*—
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,915.
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,916.

Hauser, Raimund: *See*—
Muszumanski, Trude, 3,870,401.

Hawaiian Sugar Planters Association: *See*—
Nickell, Louis G., 3,870,503.

Hawk, Gary D., to Harding Development Company. Paint tray. 3,870,420, Cl. 401-121.000.

Hawkins, Ronald G., to Aluminum Company of America. Conductor vibration damping device. 3,870,815, Cl. 174-42.000.

Hawkins, Samuel D. Dual sealing junction for gas valve and manifold. 3,870,348, Cl. 285-197.000.

Hawthorne, Peter Frederick, to Foseco International Limited. Protection of turbine casings. 3,870,595, Cl. 161-166.000.

Hayashi, Seiichi: *See*—
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi, 3,870,637.

Hayashibara Biochemical Laboratories, Incorporated,: *See*—
Hijiya, Hiromi; and Shiosaka, Makoto, 3,870,537.

Hayashibara Company: *See*—
Yoshida, Mikihiko; and Yuen, Shokichi, 3,870,704.

Hayes, John T., Jr.; and Marshall, William E., to General Foods Corporation. Protein gel modification. 3,870,812, Cl. 426-350.000.

Hayes, Lester P.; Robinson, John W.; Simms, Ross P.; and Russell, Millard E., to A. E. Staley Manufacturing Company. Process for preparing texturized protein compositions and the resulting product. 3,870,805, Cl. 426-148.000.

Hayes, Royce. Traffic control signal apparatus. 3,870,991, Cl. 340-41.00R.

Hayward, Donald M., to Rack-More Shelf Co. Combined lineal shelf and clothes bar system. 3,870,157, Cl. 211-90.000.

Hayward, John T. Means of transporting crude oil through a pipeline. 3,870,063, Cl. 137-13.000.

Hazeltine Corporation: *See*—
Vasile, Carmine F., 3,870,975.

Hazemeijer B.V.: *See*—
Clason, Jan Christiaan, 3,870,845.

Heberlein, Harold V. Toy tank. 3,869,825, Cl. 46-219.000.

Heckelsberg, Louis F.; and Banks, Robert L., to Phillips Petroleum Company. Conversion of acyclic polyenes. 3,870,763, Cl. 260-666.00A.

Heckendorn, Roland: *See*—
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 3,870,714.

Hedges, George D., to Honeywell Inc. Helmet sight visors. 3,870,405, Cl. 350-294.000.

Heede International, Inc.: *See*—
Cording, Eldon F., 3,870,161.

Hegarty, William P. Method for production of synthetic natural gas from crude oil. 3,870,481, Cl. 48-213.000.

Hegedus, Zoltan: *See*—
Stefan, Mihaly; Hegedus, Zoltan; Balazs, Fulop; and Juhasz, Gyula, 3,870,574.

Heinrich Cronau, Building Contractors: *See*—
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.

Heitkamp, Norman D.; Merker, Steven L.; and Stungis, George E., to Brown & Williamson Tobacco Corporation. Enhancement of flavor and aroma by microwave treatment. 3,870,053, Cl. 131-121.000.

Heller, William C., Jr.; and Shatzkin, Leonard. Book article. 3,870,344, Cl. 281-21.000.

Hellman, Wayne R.; Gottschalk, Klaus; and De George, Edward C., to General Electric Company. Discharge lamp having blow-molded arc tube ends. 3,870,919, Cl. 313-220.000.

Hellmer, George A.: *See*—
Wildman, Claude L.; and Hellmer, George A., 3,869,856.

Helmus, Sydney S., to Baker Oil Tools, Inc. Removable subsea production test valve assembly. 3,870,101, Cl. 166-.500.

Helmuth, James G., to Chadwick-Helmuth Electronics, Inc. Light source with optimized flash energy input to gas tube. 3,870,924, Cl. 315-200.00A.

Hencey, Thomas R., Jr.: *See*—
Boese, Harold L.; and Hencey, Thomas R., Jr., 3,870,942.

Henderson, Eulas W., to Phillips Petroleum Company. Preoxidation and pelleting of carbon black. 3,870,785, Cl. 423-460.000.

Hendrick, Fred W., to Robertshaw Controls Company. Plural rate burner with deflection of high rate flame against flame sensing element. 3,870,458, Cl. 431-80.000.

Henkel & Cie GmbH: *See*—
Stein, Werner; and Hartmann, Helmut, 3,870,735.
Wollmann, Klaus; Ploger, Walter; and Wopms, Karl-Heinz, 3,870,750.

Henniger, Peter Wolfgang; and Smid, Peter Max, to Koninklijke Nederlandsche Gist-En Spiritusfabried N.V. 6-Isocyanatoaminopenicillanic acid derivatives and process for producing them. 3,870,705, Cl. 260-239.100.

Henwood, Charles Frederick. Hand loom. 3,870,087, Cl. 139-33.000.

Herkes, John W. Mechanical screening device for machine-harvested sugar cane. 3,870,627, Cl. 209-3.000.

Herrick, Elbert C.: *See*—
DeLaMater, George B.; Herrick, Elbert C.; and Milligan, Barton, 3,870,739.

Herrmann, Frederick H. Furniture construction. 3,870,390, Cl. 312-263.000.

Herrmann, Walter: *See*—
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.

Herron, Malachy, to British Leyland UK Limited. Plant for producing wax patterns for use in investment casting. 3,870,444, Cl. 425-143.000.

Herzog, Klaus: *See*—
Neuer, Harald; Szenger, Franz; Herzog, Klaus; and Neumann, Joachim, 3,869,799.

Hesser, Heinz: *See*—
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.

Hesston Corporation: *See*—
Case, Cecil L., 3,869,861.

Hester, Donald Larry: *See*—
Adams, John William; Babaa, Ihsan Mustafa Hasan; and Hester, Donald Larry, 3,870,837.

Heybourn, Frank; and Hinchcliffe, Dennis, to Molins Limited. Feeding cigarettes. 3,870,143, Cl. 198-280.000.

Higham, John D., to Measurex Corporation. Speed optimizing system for a rolling mill. 3,869,891, Cl. 72-8.000.

Higham, John D.; and McNaught, Colin J., to Measurex Corporation. Feed forward gauge control system for a rolling mill. 3,869,892, Cl. 72-9.000.

Hijiya, Hiromi; and Shiosaka, Makoto, to Hayashibara Biochemical Laboratories, Incorporated,. Shaped solid body of pullulan ether and methods of making and using the same. 3,870,537, Cl. 106-162.000.

Hill, Robert D., Jr.: *See*—
Yunghlut, Charles W.; and Hill, Robert D., Jr., 3,869,789.

Hill, Robert L.; and Ringeman, Othmar E., to General Electric Company. Corona-free top cap terminal assembly for electron discharge devices. 3,870,393, Cl. 339-144.00T.

Hills, Marian E.; and Ayres, William M., to United States of America, Navy. Process for making whisker-like crystals of ammonium perchlorate. 3,870,577, Cl. 149-2.000.

Himes, William H., to Leyman Manufacturing Corporation. Cart stop structure for an elevator. 3,870,126, Cl. 187-8.520.

Hinchcliffe, Dennis: *See*—
Heybourn, Frank; and Hinchcliffe, Dennis, 3,870,143.

Hindin, Saul G., to Engelhard Minerals & Chemicals Corporation. Method for catalytically supported thermal combustion. 3,870,455, Cl. 431-7.000.

Hirakawa, Koichi: *See*—
Shibano, Takashi; Hirakawa, Koichi; and Yonehara, Toshimitsu, 3,870,982.

Hire, Charles John, to Fasco Industries, Inc. Thermostatic switch with solid state heater. 3,870,985, Cl. 337-381.000.

Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, to Nippon Soda Company Limited. Benzoxazole as desuckering agents. 3,870,501, Cl. 71-78.000.

Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, to Matsumoto Keishin, Director General of the Agency of Industrial Science and Technology. Method of preventing scale from being deposited in case of producing fresh water from sea water. 3,870,603, Cl. 203-7.000.

Hirschmann, Gunter: *See*—
Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, 3,870,894.

Hisamoto, Iwao: *See*—
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Hitachi, Ltd.: *See*—
Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, 3,870,897.
Nakamura, Ichiro, 3,870,077.
Okumoto, Takeomi; Ueda, Hiroshi; Sakai, Junji; and Shimada, Yogo, 3,870,529.

Hitco: *See*—
Myers, Hubert A., 3,871,001.

Hite, Harold H. Circular saw blade conveyance box. 3,870,148, Cl. 206-372.000.

Hochman, Jack M.: *See*—
Arnold, George T.; Hochman, Jack M.; and Pennington, Robert E., 3,870,621.

Hoechst Aktiengesellschaft: *See*—
Gordon, Wolfgang; Rust, Kurt; and Schrott, Erwin, 3,870,690.
Rauterkus, Karl Josef; and Blazek, Jan, 3,870,673.
Schadlich, Gunther; and Moraw, Roland, 3,871,002.

Hoehn, Wolfgang, to ITT Industries, Inc. Frequency-to-voltage converter. 3,870,898, Cl. 307-233.000.

Hoekstra, Karl E.: *See*—
Farrauto, Robert J.; Hoekstra, Karl E.; and Shoup, Robert D., 3,870,658.

Hoerner Waldorf Corporation: *See*—
Tull, Herbert G., III, 3,870,166.

Hofel, Heinz-Bernard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, to Reichhold-Albert-Chemie Aktiengesellschaft. Process for the manufacture of dispersions of thermosetting reaction products. 3,870,669, Cl. 260-29.300.

Hofel, Heinz-Bernhard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, to Reichhold-Albert-Chemie Aktiengesellschaft. Process for the manufacture of dispersions of thermosetting reaction products. 3,870,670, Cl. 260-29.300.

Hoffacker, Franz: *See*—
Jores, Willi; Hoffacker, Franz; and Lehmann, Helmut, 3,870,584.

Hoffman, Marcus I., III: *See*—
Dixson, Bruce E.; Hoffman, Marcus I., III; and Walls, Milton A., 3,870,495.

Hoffman, Orville William, to General Electric Company. Lubricant cooling apparatus for a vertical electric motor. 3,870,907, Cl. 310-64.000.

Hoffmann, Helmut; and Hoffmann, Walter. Door jamb liner. 3,869,840, Cl. 52-211.000.

Hoffmann, Walter: *See*—
Hoffmann, Helmut; and Hoffmann, Walter, 3,869,840.

Hofmann, Lebert Arthur: *See*—
Dutkewych, Oleh Borys; and Hofmann, Lebert Arthur, 3,870,068.

Hokama, Takeo, to Velsicol Chemical Corporation. Mixed salts of aluminum. 3,870,732, Cl. 260-408.000.

Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., to USM Corporation. Injection molding machine controls. 3,870,445, Cl. 425-144.000.

Holdsworth, Robert S.; O'Neill, Gerald Joseph; and Simons, Charles William, to W. R. Grace & Co., by said Simons. Anesthetic halogenated cyclobutanes. 3,870,797, Cl. 424-352.000.

Holl, Richard Adolf, to Micron Engineering Inc. Venturi-type devices. 3,870,082, Cl. 138-40.000.

Holly, Harry H., to Hollymatic Corporation. Molding apparatus with valved air release. 3,869,757, Cl. 17-32.000.

Hollymatic Corporation: *See*—
Holly, Harry H., 3,869,757.
Wagner, Richard C., 3,870,013.

Holmes, Douglas B.: *See*—
Burke, Edward F.; and Holmes, Douglas B., 3,871,013.

Holmes, Richard E., to Eli Lilly and Company. Cinchoninic acid derivatives. 3,870,712, Cl. 260-240.00A.

Holson, Sheldon. Photographic album page and method of making same. 3,869,820, Cl. 40-159.000.

Holt, Frederick R.; and Fluckiger, Noah, to Acme-Cleveland Corporation. Proximity circuit with active device feedback. 3,870,948, Cl. 324-34.0PS.

Holtz, Richard L., to Harter Corporation. Fully enclosed, adjustable, support column for a pivotal chair. 3,870,270, Cl. 248-406.000.

Holub, Frank W. Dual tricycle kit. 3,870,338, Cl. 280-209.000.

Holub, Jiri, to Vyzkumny ustav tvarecich streju a technologie tvareni. Arrangement for forming solids of rotation by a cross wedge rolling process with three rolls. 3,869,895, Cl. 72-107.000.

Honeywell Inc.: *See*—
Hedges, George D., 3,870,405.

Honeywell Information Systems Inc.: *See*—
Umbaugh, Charles Wayne, 3,869,787.

Hook, Edwin O.: *See*—
Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,870,768.

Hooker Chemical & Plastics Corporation: *See*—
Golborn, Peter; and Duffy, James J., 3,870,771.

Hooker Chemicals & Plastics Corporation: *See*—
Minklei, Alfred O.; and Peterson, John A., 3,870,554.

Hoover Company, The: *See*—
Boyd, Wilton E.; and Rennecker, David B., 3,869,751.

Hopkins, Philip Ward: *See*—
Button, David; and Hopkins, Philip Ward, 3,870,908.

Horrell, Robert E., to Carter Mfg., Inc. Locking device for roll-up awnings. 3,870,096, Cl. 160-305.000.

Horrocks, Raymond G., to Scott & Fetzer Company, The. Tool for removing covering material from a cable. 3,869,791, Cl. 30-90.100.

Horvath, James, to B. F. Goodrich Company, The. Method and apparatus for determining transformation temperatures. 3,869,912, Cl. 73-150.00R.

Horwitt, Laurence G.; and Mattis, Donald J., to Casco Products Division, Sun Chemical Corporation. Cigar lighter igniting unit. 3,870,857, Cl. 219-267.000.

Hosokawa, Kenjiro: *See*—
Ida, Syunya; and Hosokawa, Kenjiro, 3,870,542.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. 2-Methyl-3-substituted-4-aryl isoquinolines. 3,870,722, Cl. 260-283.00R.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. Substituted phenyl acetic acids. 3,870,751, Cl. 260-515.00R.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. Acyl substituted indane carboxylic acids. 3,870,752, Cl. 260-515.00R.

Houston, Reagan. Regenerative incinerator systems for waste gases. 3,870,474, Cl. 23-277.00C.

Houston, William T. Remotely controllable subterranean oil well valve. 3,870,098, Cl. 166-55.100.

Howard, Ivy J. Scaffold ladder structure. 3,870,124, Cl. 182-178.000.

Howard, John: *See*—
Gibney, Kelly B.; Howard, John; and Evans, Russell S., 3,870,703.

Howard, Walter B., to National-Standard Company. Adjustment mechanism for an extruder die. 3,870,453, Cl. 425-465.000.

Howatt, George F., to New England Envelope Manufacturing Co. Envelope machine. 3,869,965, Cl. 93-61.00A.

Howe, James M. Combination golf putting aid and divot repairer. 3,870,299, Cl. 273-32.00B.

Howe Richardson Scale Company: *See*—
Davis, Austin L.; and Davidson, Harley R., 3,869,982.

Hruby, Frank J. Process for producing a livestock feed. 3,870,798, Cl. 426-53.000.

Hubbard, David W., to Pitney-Bowes, Inc. Ink jet postage printing apparatus. 3,869,986, Cl. 101-91.000.

Huber, Kenneth C., to Burlington Industries, Inc. System for controlling an electric field. 3,870,933, Cl. 317-262.0AE.

Huber, Mortimer J. Frame structure for loader. 3,870,172, Cl. 214-140.000.

Huber, Reinhold: *See*—
Koester, Waldemar; and Huber, Reinhold, 3,870,424.

Huber, Robert J.: *See*—
Smith, Kent F.; and Huber, Robert J., 3,870,901.

Hudson, David W.: *See*—
Brock, Robert J.; and Hudson, David W., 3,870,592.

Huey, Richard Meredith; and Rajaratnam, Krishna, to Unisearch Limited. Earth grid. 3,870,925, Cl. 317-9.00R.

Hufnagl, Johann: *See*—
Nitsche, Herbert; and Hufnagl, Johann, 3,870,930.

Hug-Inderbitzin, Marianne: *See—*
Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,870,659.
Hughes Aircraft Company: *See—*
Kyle, Nanse R., 3,870,473.
Hughes, Michael Alan, to English Electric Company Limited, The. Capacitor voltage transformer system. 3,870,926, Cl. 317-12.00B.
Hughes, Michael Alan, to English Electric Company Limited, The. Capacitor voltage transformer system. 3,870,927, Cl. 317-12.00B.
Hughes, Peter Graham; and Verge, John Pomfret, to Lilly Industries Limited. Nitrothiazole derivatives. 3,870,725, Cl. 260-302.00H.
Hughes, Richard Smith, to United States of America, Navy. Ramp/hold circuit. 3,870,906, Cl. 307-261.000.
Hughes Tool Co.: *See—*
Lemont, Harold Edminston, 3,870,255.
Hultquist, John V. Clamp construction. 3,870,359, Cl. 294-118.000.
Hummel, John, to Poly-Version, Inc. Sterile plastic glove and package assembly. 3,870,150, Cl. 206-438.000.
Humphrey, Anthony Martin, to Bush Boake Allen Limited. Inhibiting beer gushing. 3,870,810, Cl. 426-329.000.
Humphrey, David H. Levelling instrument. 3,869,806, Cl. 33-348.000.
Humphrey, Frank. Marine sewage treatment system for water craft. 3,870,634, Cl. 210-220.000.
Hunger, Alfred; and Janssen, Hans-Jochen, to Ciba-Geigy Corporation. Pharmaceutical preparation. 3,870,796, Cl. 424-330.000.
Hunnicutt, Wayne E.; and Rossbach, Peter G., to Applied Power Industries, Inc. Method of reforming and straightening members. 3,869,767, Cl. 24-243.0CC.
Hunt, George R., to Minnesota Mining and Manufacturing Company. System for growing shellfish. 3,870,020, Cl. 119-4.000.
Huot Manufacturing Company: *See—*
Huot, William J., 3,870,149.
Huot, William J., to Huot Manufacturing Company. Drill holding case. 3,870,149, Cl. 206-379.000.
Hurlbut, William Barrett, Sr.; Liebig, Preston Dean; and Maurin, Gerald, to Combustion Engineering, Inc. Module suspension system. 3,870,487; Cl. 55-436.000.
Hurletron Incorporated: *See—*
Coberley, Daniel A., 3,870,936.
Hurst, William Edward, to Mono Pumps (Engineering) Limited. Method and apparatus for mixing a powder with a flowable substance. 3,870,283, Cl. 259-4.000.
Hurton, William: *See—*
Binks, Sidney David; and Hurton, William, 3,870,890.
Hurwitz, Melvin D., to Rohm and Haas Company. Non-flammable polyester textile articles and methods for making them. 3,870,590, Cl. 161-92.000.
Hussey, Edward B., to Domtar Limited. Celiular concrete unit coated with air permeable, water repellent concrete coating. 3,870,553, Cl. 117-123.00A.
Hutchings, Bernard David Francis, to Pye Limited. Crane safe load indicator. 3,870,160, Cl. 212-39.00R.
Hutchings, David A., to Goodyear Tire & Rubber Company, The. Oxidation of phenols and alkyl substituted phenols to their corresponding para-benzoquinone. 3,870,731, Cl. 260-396.00R.
Hutchinson, Ronald R.; Emley, Grace S.; Hallin, Edward R.; and Murray, Nancy J., to Foundation for Behavioral Research. Treatment of certain emotional disorders with nicotine compounds. 3,870,794, Cl. 424-264.000.
Hydril Company: *See—*
Mott, James D., 3,870,102.
Mott, James D., 3,870,104.
Hydrocarbon Research, Inc.: *See—*
Johnson, Axel R.; Wolk, Ronald H.; and Alpert, Seymour B., 3,870,623.
I.C.S. Ignition Control Systems Ltd.: *See—*
Filip, Stanislaw F., 3,870,846.
Ianno, Kazuo: *See—*
Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, 3,870,603.
Ibing, Gunther; and Neubold, Kurt, to Veba-Chemic AG. Preparation of aromatic dinitriles. 3,870,743, Cl. 260-465.00C.
Ichioka, Satoshi: *See—*
Takeuchi, Shinjiro; and Ichioka, Satoshi, 3,870,973.
Ida, Syunya; and Hosokawa, Kenjiro, to Kanegafuchi Boseki Kabushiki Kaisha. Process of treating fibrous articles with microcapsules containing hydrophobic treating agent. 3,870,542, Cl. 117-33.300.
Iguchi, Tateo: *See—*
Yoshida, Shuji; and Iguchi, Tateo, 3,870,769.
Ihasz, Richard, to Sperry Rand Corporation. Hair trimmer. 3,869,790, Cl. 30-90.000.
Ihlenfeld, Russell E., to Dart Industries, Inc. Coffee maker. 3,869,968, Cl. 99-280.000.
Iida, Hiroshi, to Manno Kogyo Kabushiki Kaisha. Apparatus for correcting deformation of a slender metallic products. 3,869,897, Cl. 72-125.000.
Iino, Hideo; and Iizuka, Satoru, to SKB Arms Company; Comet Corporation; and Noguchi, Yoshiaki. Artificial target recovery and delivery equipment for use in new shooting game. 3,870,306, Cl. 273-105.600.
IIT Research Institute: *See—*
Camras, Marvin, 3,871,024.
Iizuka, Satoru: *See—*
Iino, Hideo; and Iizuka, Satoru, 3,870,306.
Ikeda, Kyoichi: *See—*
Miyauchi, Rin-Ichi; Saito, Bunjiro; and Ikeda, Kyoichi, 3,869,920.
Ikenga, Junichi; Matsuoka, Shigeru; and Okabe, Yoshio, to Kabushiki Kaisha Fujikoshi. Method and circuit for sampling position data. 3,870,941, Cl. 318-636.000.
Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Heat developable photographic material containing azo dyes as sensitizers. 3,870,523, Cl. 96-114.100.
Ikenoue, Shinpei: *See—*
Kubotera, Kikuo; Ikenoue, Shinpei; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,870,479.
Ilin, Lev Mikhailovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Illinois Tool Works Inc.: *See—*
Barth, Gerald Dean; and Alexander, John Bert, 3,869,957.
Murayama, Hiroo, 3,869,958.
Imperial Chemical Industries, Limited: *See—*
Birchall, James Derek; and Cassidy, John Edward, 3,870,737.
Castro, Roger Albert; Orman, Richard John; and Ryan, James Ernest, 3,870,775.
Cowling, Ronald; and Greenshields, James Nairn, 3,870,559.
Doschko, Werner; Fohlisch, Wolfgang; and Wensch, Alfred, 3,869,853.
Stacey, Martyn Hugh; and Tribbeck, Terrence Donald, 3,870,762.
Steel, Margaret Lilian, 3,870,778.
Syson, John William; and Kerridge, John Charles, 3,870,667.
Imperial-Eastman Corporation: *See—*
Strybel, Richard V., 3,870,432.
Improved Machinery Inc.: *See—*
Clarke-Pounder, Ian J. H., 3,870,635.
Inamoto, Yoshiaki; and Nakayama, Hirokazu. 1-Adamantyl alkyl ketones and their preparation. 3,870,759, Cl. 260-586.00G.
Industrie Pirelli S.p.A.: *See—*
Tangorra, Giorgio, 3,870,095.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Miller, Harry B., 3,870,240.
Industrikompaniet: *See—*
Asplund, Alf Ake, 3,870,201.
Infra Systems, Inc.: *See—*
Williams, Paul, 3,870,884.
Innovare I Taby Aktiebolag: *See—*
Lofgren, Stig Tore Johannes, 3,870,388.
Inoue, Michiro; Ishikawa, Masayuki; Tsuchiya, Takashi; and Shimamoto, Takio. Certain dihydrophthalizines for treating hemorrhage and thrombosis. 3,870,792, Cl. 424-250.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Martin, Daniel; and Vayssiere, Pierre, 3,870,510.
Institut Francais Du Petrole Des Carburants et Lubrifiants: *See—*
Castel, Yvon; and Castela, Andre, 3,870,112.
Torck, Bernard; Derrien, Michel; and Franck, Jean-Pierre, 3,870,653.
Institut Jozef Stefan: *See—*
Stupar, Janex, 3,870,234.
Institutul De Cercetare Si proiectare Pentru Industria Electrotechnica: *See—*
Lazaroiu, Dumitru Florian; Sleiher, Sigmund; and Mihaiescu, Gheroghe Mihai, 3,869,788.
Institutul Pentru Creatie Stintifica Si Technica-Increst: *See—*
Teodorescu, Constantin Gh.; and Ardeleanu, Stefan P., 3,870,250.
International Business Machines Corporation: *See—*
Edds, Kenneth E.; Elbert, Donald L.; and Stone, Jerry F., 3,870,528.
King, William J.; and Wilcox, David L., 3,871,014.
Lin, Paul T. C.; and Winter, Edwin M., 3,871,015.
Malaviya, Shashi D., 3,870,900.
International Fastener Establishment: *See—*
Umezu, Hideo, 3,869,764.
International Flavors & Fragrances, Inc.: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,870,800.
International Partners Research Corporation: *See—*
Buffett, Thomas Vigus, 3,870,188.
International Standard Electric Corporation: *See—*
Underwood, John Duckles, 3,870,614.
International Telephone and Telegraph Corporation: *See—*
Carlson, Elmer A., 3,870,929.
Cuny, John J., 3,870,917.
Dugger, William H.; and Alexander, Wayne K., 3,870,199.
Gezari, Walter A., 3,870,084.
Ohlstein, Herbert; and Gruber, Alan H., 3,870,974.
Straw, Richard D., 3,870,957.
Uncapher, Richard Danby, 3,870,579.
Interstate Utilities Corporation: *See—*
Berg, Roy E., 3,870,484.
Irie, Akira: *See—*
Uno, Hitoshi; and Irie, Akira, 3,870,724.
Irsai, Eugene. Retaining wall support device. 3,869,868, Cl. 61-49.000.
Irwin, Malcolm F., to Pro-Tech Inc. Liquid sampling. 3,869,921, Cl. 73-421.00B.
Iseda, Yutaka: *See—*
Onishi, Akira; Yukuta, Toshio; Iseda, Yutaka; and Iwami, Kouichi, 3,870,620.

Ishida, Yoshio, to Diamond Electric Mfg. Co., Ltd. Ignition system for internal combustion engines. 3,870,028, Cl. 123-148.00E.

Ishii, Akemi; and Suda, Syotaro, to Tokico Ltd. Unidirectional rotation actuator. 3,869,928, Cl. 74-88.000.

Ishikawa, Makoto: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Ishikawa, Masayuki: *See—*
Inoue, Michiro; Ishikawa, Masayuki; Tsuchiya, Takashi; and Shimamoto, Takio, 3,870,792.

Ishikawa, Norikatsu: *See—*
Goto, Kenji; Mitsui, Ryozo; and Ishikawa, Norikatsu, 3,869,858.

Isitovsky, Ilya Leonidovich; and Zelikman, Grigory Avrumovich. Method of making a profiled p-n junction in a plate of semiconductive material. 3,870,576, Cl. 148-188.000.

Ital Elettronica S.p.A.: *See—*
Casale, Renato, 3,870,886.

Ito, Hisakatu: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,870,698.

Ito, Testuo. Stringed instrument. 3,869,954, Cl. 84-291.000.

Itoh, Kensuke: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

ITT Industries, Inc.: *See—*
Adam, Fritz Gunter; and Renz, Albrecht, 3,869,786.
Belart, Juan; Fink, Werner; Kircher, Dieter; and Von Grunberg, Hubertus, 3,870,377.
Hoehn, Wolfgang, 3,870,898.

IV Conversion Systems, Inc.: *See—*
Minnick, Leonard John; Smith, Charles L.; and Webster, William C., 3,870,535.

Ivaschenko, Pavel Andreevich: *See—*
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; and Samoilovsky, Igor Vasilievich, 3,870,433.

Iwahashi, Masaaki: *See—*
Miyamoto, Tadashi; and Iwahashi, Masaaki, 3,869,882.

Iwami, Ichiro; Matsunaga, Tsutomu; and Yoneyama, Ken, to Bridgestone Tire Company Limited. Method of treating glass fibers using ultrasonic vibration. 3,870,551, Cl. 117-115.000.

Iwami, Kouichi: *See—*
Onishi, Akira; Yukuta, Toshio; Iseda, Yutaka; and Iwami, Kouichi, 3,870,620.

Iwano, Haruhiko: *See—*
Shimamura, Isao; Shishido, Tadao; Ohi, Reiichi; and Iwano, Haruhiko, 3,870,520.

Iwatani, Akitoshi: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Iyengar, Rama; Zuber, Bretislav Paul; and Boucher, Jean Raymond, to Northern Electric Company Limited. Smooth tape formation of tubes. 3,869,902, Cl. 72-52.000.

Izumi, Hitoshi, to Mitsui Shipbuilding and Engineering Co. Ltd. Apparatus for raising and lowering a heavy weight. 3,870,123, Cl. 182-136.000.

J. Bobst & Fils S.A.: *See—*
Meylan, Geroges, 3,870,213.

J. Bobst & Fils SA: *See—*
Wieser, Louis, 3,870,140.

J. E. Love Company: *See—*
May, Donald L., 3,869,847.

J. S. Staedtler: *See—*
Mutschler, Otto, 3,870,421.

J. W. Microelectronics Corporation: *See—*
Arakelian, Hagop; and Wright, Jeffrey L., 3,869,812.

J. Wiss & Sons Co.: *See—*
Ferguson, William C., 3,869,793.

Jack, Harry Ross Scarlett; Richards, Peter Henry; and Skelding, Kenneth George, to Triplex Safety Glass Company Limited. Apparatus for bending glass sheets. 3,870,500, Cl. 65-273.000.

Jackman, John A. Bullet mold. 3,870,272, Cl. 249-170.000.

Jackson, Jeffrey Mack. Securing means for concrete reinforcing basket. 3,870,428, Cl. 404-134.000.

Jackson, Sydney; and Titterington, Joseph Bell, to Ferranti Limited. Construction of packages for semiconductor devices. 3,871,018, Cl. 357-74.000.

Jacobs, Christopher A. Capacitive discharge ignition system having protective unidirectional circuit. 3,870,026, Cl. 123-148.00R.

Jacobs, Christopher A. Capacitive discharge ignition system having variable voltage inverter. 3,870,027, Cl. 123-148.00R.

Jager, Gerhard; Plempel, Manfred; and Buchel, Karl Heinz, to Farbenfabriken Bayer Aktiengesellschaft. Derivatives of 3-azolylpropyne and processes for their preparation and use. 3,870,726, Cl. 260-309.000.

Jahn, Walter, to JENAer Glaswerk Schott & Gen. Optical flint glass with relatively low refractive indices and high dispersion. 3,870,531, Cl. 106-52.000.

Jakel, Gus R., to California Cement Shake Co., Inc. Cementitious roofing and siding production. 3,870,777, Cl. 264-71.000.

James, J. Michael, to Cyborg Corporation. Personal galvanic skin response monitoring instrument. 3,870,034, Cl. 128-2.10Z.

Janiszewski, Casimer, to G. S. Blakeslee Co. Dish washing machine drain unit. 3,870,067, Cl. 137-242.000.

Janssen, Hans-Jochen: *See—*
Hunger, Alfred; and Janssen, Hans-Jochen, 3,870,796.

Japan Gasoline Co., Ltd.: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.
Yamamoto, Kenzo; Matsuoka, Seiichi; and Shioda, Toshio, 3,870,738.

Jeffery, Richard. Game board primarily for small children. 3,870,310, Cl. 273-131.0BA.

JENAer Glaswerk Schott & Gen: *See—*
Jahn, Walter, 3,870,531.

Johansson, Erik Karl Gustav: *See—*
Eriksson, Bolik Anders Gottfrid; Johansson, Erik Karl Gustav; and Vukotic, Milos, 3,870,486.

John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,870,721.

Johns-Manville Corporation: *See—*
Afflerbach, Frank D.; Barnett, Irvin; and Peters, Walter B., 3,870,581.
Kietzman, John Howard; and Tocci, Mario Peter, 3,870,426.

Johnson, Axel R.; Wolk, Ronald H.; and Alpert, Seymour B., to Hydrocarbon Research, Inc. Hydroconversion process of residuum oils. 3,870,623, Cl. 208-108.000.

Johnson, Lewis T., to Phillips Petroleum Company. Tray. 3,870,151, Cl. 206-507.000.

Johnson Service Company: *See—*
Chacon, Manuel Frank, 3,870,829.

Johnson, Waldo O.; and Walters, Rodney P., to Louisiana-Pacific Corporation. Adjustable window seat guide. 3,869,839, Cl. 52-204.000.

Johnson, Walter N.: *See—*
Peterson, William R.; and Johnson, Walter N., 3,870,770.

Johnson, Wayne R., to Abbott Laboratories. Probability analog function computer. 3,870,872, Cl. 235-197.000.

Jones, Alan P., to Pennsylvania Research Associates Inc. Control mechanisms for document-handling apparatus. 3,870,868, Cl. 235-92.0SB.

Jones, John E.: *See—*
Schneiderhan, Edward M.; Jones, John E.; and Briggs, Henry P., 3,870,865.

Jones, Rufus S.; and Conciatori, Anthony B., to Celanese Corporation. Catalytic method for producing aromatic polyamides. 3,870,685, Cl. 260-78.00R.

Jores, Willi; Hoffacker, Franz; and Lehmann, Helmut, to Agfa-Gevaert Aktiengesellschaft. Automatic double-side adhesive device for bands or webs. 3,870,584, Cl. 156-505.000.

Jousson, Pierre Jean: *See—*
Moret, Michel Antoine Cesar; and Jousson, Pierre Jean, 3,870,039.

Juge, Mark A. Rotary steam vapor and external combustion engine. 3,869,863, Cl. 60-39.190.

Juhasz, Gyula: *See—*
Stefan, Mihaly; Hegedus, Zoltan; Balazs, Fulop; and Juhasz, Gyula, 3,870,574.

Jurasek, Walter R., to Avoset Food Corporation. Aseptic vacuum breaker. 3,870,066, Cl. 137-199.000.

Kabushiki Kaisha Fujikoshi: *See—*
Ikenga, Junichi; Matsuoka, Shigeru; and Okabe, Yoshio, 3,870,941.

Kabushiki Kaisha Ricoh: *See—*
Machida, Hazime; and Okuno, Zenjiro, 3,870,644.
Yamada, Hiroshi; and Kojima, Kenji, 3,870,246.

Kadi-Ogly, Ibragim Akhmedovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; and Kadi-Ogly, Ibragim Akhmedovich, 3,870,913.

Kalfaian, Meguer V. Phonetic sound recognizer for all voices. 3,870,817, Cl. 179-1.0SA.

Kall, Horst; and Riedel, Klaus, to L. & C. Steinmuller G.m.b.H. Apparatus for separating liquid from a liquid containing gas flow. 3,870,493, Cl. 55-391.000.

Kallel, Allen, to Wemac Company. Valve construction. 3,870,275, Cl. 251-252.000.

Kalyan, Jagdish C.: *See—*
Austin, George E.; and Kalyan, Jagdish C., 3,869,962.

Kamerling, Marc A.: *See—*
Wilson, Harold R.; and Kamerling, Marc A., 3,870,404.

Kamo, Seiichi; Yanai, Noriyoshi; and Osako, Naoto, to Mitsubishi Chemical Industries Limited. Method for manufacturing nitrogen-containing compounds. 3,870,755, Cl. 260-553.00R.

Kanada, Yoshimi: *See—*
Takamura, Isutomu; Kanada, Yoshimi; and Suzuki, Shintari, 3,870,564.

Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Ida, Syunya; and Hosokawa, Kenjiro, 3,870,542.

Kaplan, Paul N., to Air Products and Chemicals, Inc. Load bearing device. 3,870,152, Cl. 206-523.000.

Kappeler, Peter; and Uhlig, Klaus, to Brown-Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Conduit elbow. 3,870,346, Cl. 285-47.000.

Kappl, Gerhard: *See—*
Steinbatz, Alfred; and Kappl, Gerhard, 3,871,009.

Karkhachev, Jury Georgievich: *See—*
Karpacheva, Susanna Mikhailovna; Karkhachev, Jury Georgievich; Muratov, Valeryan Matveevich; and Raginsky, Leonid Solomonovich, 3,870,638.
Karonis, George Peter. Dry soil process. 3,870,425, Cl. 404-76.000.
Karpacheva, Susanna Mikhailovna; Karkhachev, Jury Georgievich; Muratov, Valeryan Matveevich; and Raginsky, Leonid Solomonovich. Pulsating filter-thickener. 3,870,638, Cl. 210-333.000.
Karpekin, Viktor Vladimirovich: *See—*
Rybalko, Alexei Petrovich; Karpekin, Viktor Vladimirovich; Didenko, Nikolai Sidorovich; and Volokhov, Ivan Ivanovich, 3,869,871.
Kasuga, Masao: *See—*
Takahashi, Nobuaki; and Kasuga, Masao, 3,870,971.
Kato, Nobuo; Nakamura, Toshio; and Terakado, Seishi, to Matsushita Electric Industrial Co., Ltd. Heat-sensitive device. 3,870,983, Cl. 337-107.000.
Kato, Takahisa: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, to Daikin Kogyo Co. Ltd. 2-Hydroxy-1,1,2,3,3-pentahydro-perfluoroalkyl derivatives. 3,870,748, Cl. 260-475.00F.
Kaugars, Girts, to Upjohn Company, The. Weed control with substituted phenylhydrazones. 3,870,505, Cl. 71-121.000.
Kaupp, Norbett H., to Xerox Corporation. Method for electrostatic paper stripping by neutralization of transfer charge. 3,870,515, Cl. 96-1.400.
Kawagoe, Hiroto: *See—*
Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, 3,870,897.
Kawaguchi, Hideo: *See—*
Yamamoto, Nobuo; Kawaguchi, Hideo; and Furukawa, Katsuharu, 3,870,525.
Kawamura, Takeji. Action spring assembly for forwardly urging the action bar of shotguns. 3,869,961, Cl. 89-191.00A.
Kayani, Ghulam A.: *See—*
Brown, Earle C.; Byers, Errol J.; and Kayani, Ghulam A., 3,870,951.
Kearns, Tommy Carter; and Stoltenberg, Donald A., to Pureco Systems, Inc. Apparatus and method for evaporative concentration of aqueous solutions and slurries. 3,870,585, Cl. 159-4.00A.
Keelavite Hydraulics Limited: *See—*
Duckworth, Peter, 3,869,860.
Keeler, Robert Emerson: *See—*
Corwin, Walter Leo; Keeler, Robert Emerson; and Rubin, Philip Edward, 3,870,838.
Keirn, Robert E. Continuous flow grain drying apparatus. 3,869,809, Cl. 34-174.000.
Keller, Klaus. Device for bending serpentine struts. 3,869,926, Cl. 74-25.000.
Kelsey-Hayes Company: *See—*
Riordan, Hugh E., 3,870,376.
Kennecott Copper Corporation: *See—*
Wright, Craig Nellis; and Richards, Kenneth Julian, 3,870,779.
Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See—*
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,915.
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,916.
Presser, Karl-Heinz; and von der Decken, Claus-Benedict, 3,869,919.
Kerridge, John Charles: *See—*
Syson, John William; and Kerridge, John Charles, 3,870,667.
Kerschner, Paul M.; and Marcellis, Alphonso W., to Cities Service Oil Company. Petroleum hydrocarbon compositions. 3,870,643, Cl. 252-56.00R.
Keyworth, Donald A.: *See—*
Walker, David G.; Keyworth, Donald A.; and Sudduth, Jerome R., 3,870,482.
Khanna, Jai K.: *See—*
Crook, James E.; Cutler, John F., Jr.; and Khanna, Jai K., 3,870,029.
Khazanov, Mikhail Semenovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.
Khodykin, Boris Danilovich: *See—*
Rannev, Alexandr Vladimirovich; Reish, Arvid Karlovich; Svirsky, Viktor Alexandrovich; and Khodykin, Boris Danilovich, 3,869,814.
Kidde, Gustave E. Removal of phosphate compounds from fluoride containing solutions. 3,870,786, Cl. 423-484.000.
Kiessling, Hans-Joachim: *See—*
Hofel, Heinz-Bernard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,669.
Hofel, Heinz-Bernhard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,670.
Kietzman, John Howard; and Tocci, Mario Peter, to Johns-Manville Corporation. Method of protecting pavement from corrosive salts and an impermeable pavement membrane and pavement overlay for use in said method. 3,870,426, Cl. 404-82.000.
Kiko, Frederick, to Lorain Products Corporation. Controllable current source. 3,870,896, Cl. 307-34.000.
Killam, Oliver P. Filing cabinet construction. 3,870,389, Cl. 312-257.00R.
Kimberly-Clark Corporation: *See—*
Brock, Robert J.; and Hudson, David W., 3,870,592.
Werner, Edward E., 3,870,167.
King, William J.; and Wilcox, David L., to International Business Machines Corporation. Flip chip module with non-uniform solder wettable areas on the substrate. 3,871,014, Cl. 357-67.000.
Kinoshita, Showzo, to Pioneer Electronic Corporation. Expandable suspension system for loudspeaker bobbin. 3,870,833, Cl. 179-115.5VC.
Kinroth & Son Mfg. Co.: *See—*
Lapp, Ellsworth W., 3,869,917.
Kipke, Eberhard; and Losensky, Erich, to Siemens Aktiengesellschaft. Smooth-core rotor for a synchronous electric machine. 3,870,912, Cl. 310-183.000.
Kircher, Dieter: *See—*
Belart, Juan; Fink, Werner; Kircher, Dieter; and Von Grunberg, Hubertus, 3,870,377.
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of oxocarboxylic acid amides and oxocarboxylic acids. 3,870,757, Cl. 260-559.00R.
Kirr, Frederick M., to Spindler & Sauppe, Inc. Variable capacity flexible slide magazine. 3,870,408, Cl. 353-120.000.
Kise, Mearl A.: *See—*
Ellis, Leonard C.; and Kise, Mearl A., 3,870,756.
Klages, Ruth Kulisch geb. Bubble mat for bath tubs. 3,870,040, Cl. 128-66.000.
Klaue, Hermann. Brake arrangement for vehicles. 3,870,118, Cl. 180-75.000.
Klay, William F., to Waltz, Dale M., a part interest. Hinge assembly. 3,869,752, Cl. 16-128.000.
Klein, Donald L., to Marspring Corporation. Cushion or mattress construction. 3,869,739, Cl. 5-353.000.
Klein, Erich, to Dragoco Spezialfabrik konz. Riech-und Aromastoffe Gerberding & Co. GmbH. Isomeric mixture of bicyclic nitriles and their method of preparation. 3,870,742, Cl. 260-464.000.
Klein, Herschel Alan; and Bozzuto, Carl Richard, to Combustion Engineering, Inc. Air pollution control system. 3,870,781, Cl. 423-242.000.
Kleindienst & Co. Maschinenfabrik: *See—*
Donner, Sigmar, 3,870,294.
Kleppe, Byrge; and Torgersen, Ole, to A/S Raufoss Ammunisjonsfabrikker. Heat exchange conduit. 3,870,081, Cl. 138-38.000.
Klingler, Richard E.; and Roberts, Jeffrey A. Houseboat hull. 3,870,005, Cl. 114-66.50R.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Schlotterbeck, Heinz; and Staake, Walter, 3,869,938.
Klotzer, Sieghart: *See—*
Moisar, Erik; and Klotzer, Sieghart, 3,870,522.
Kluger, Alois: *See—*
Korting, Reinhard; and Kluger, Alois, 3,870,100.
Klupp, George A., to Bratton, Myrla. Board game apparatus. 3,870,311, Cl. 273-131.0AB.
Knapp, George P.: *See—*
Gallant, James O.; Staples, Robert E.; and Knapp, George P., 3,869,774.
Knapp, Robert G.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.
Knight Engineering and Molding Co.: *See—*
Bennett, Richard H., 3,870,187.
Knight, Peter Michael: *See—*
Tooze, Michael John; and Knight, Peter Michael, 3,870,938.
Knipp, Ulrich, to Bayer Aktiengesellschaft. Vehicle wheel. 3,870,372, Cl. 301-63.0PW.
Knott, Roger L.; and Taunton-Rigby, Alison, to United States of America, Health Education and Welfare. Synthesis of n-5-methyltetrahydrohomofolic acid and related reduced derivatives of homofolic acid. 3,870,719, Cl. 260-251.500.
Knutsen, Odd. Chair or analogous article of furniture. 3,870,365, Cl. 297-320.000.
Kobashi, Mamoru: *See—*
Senda, Katsuyuki; and Kobashi, Mamoru, 3,870,918.
Kobayashi, Isamu: *See—*
Wakamiya, Kinji; and Kobayashi, Isamu, 3,871,007.
Kobayashi, Kesanao: *See—*
Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, 3,870,524.
Kobayashi, Morio: *See—*
Kondo, Mamoru; and Kobayashi, Morio, 3,871,003.
Kobayashi, Shigeru: *See—*
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,870,694.
Kobayashi, Yukio: *See—*
Hatano, Fukuji; and Kobayashi, Yukio, 3,870,330.

Kober AG: *See—*
Koester, Waldemar; and Huber, Reinhold, 3,870,424.
Koch, Robert E.: *See—*
Rusk, Gerald; and Koch, Robert E., 3,870,092.
Kochs Adler AG: *See—*
Scholl, Hans, 3,869,998.
Koehler, Waldemar; Riedel, Oswald; Scherer, Hertbert; and Schlereth, Georg, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Isothermal calorimetry method and apparatus therefor. 3,869,914, Cl. 73-190.00R.
Koehring Company: *See—*
Kruder, George A., 3,870,284.
Koester, Waldemar; and Huber, Reinhold, to Kober AG. Expansion gap sealing device. 3,870,424, Cl. 404-67.000.
Kogert, Herbert, to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft. Process and apparatus for cutting rubberised stranded wire. 3,870,852, Cl. 219-121.0LM.
Kojima, Hiromitsu, to Mitsui Mining and Smelting Co., Ltd. Conveyor apparatus for metal bars. 3,870,169, Cl. 214-41.000.
Kojima, Kenji: *See—*
Yamada, Hiroshi; and Kojima, Kenji, 3,870,246.
Kondo, Mamoru; and Kobayashi, Morio, to Nippon Telegraph and Telephone Public Corporation. Electrostatic recording apparatus with core matrix. 3,871,003, Cl. 346-74.0ES.
Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Zuideveld, Reinder, 3,870,189.
Koninklijke Nederlandsche Gist-En Spiritusfabried N.V.: *See—*
Henniger, Peter Wolfgang; and Smid, Peter Max, 3,870,705.
Konishiroku Photo Industry Co., Ltd.: *See—*
Uchida, Y .suo; and Kuroyanagi, Yoshitaka, 3,871,005.
Korner, Otto, to DIEHL. Track link unit. 3,870,380, Cl. 305-36.000.
Koroleva, Margarita Borisovna: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.
Korting, Reinhard; and Kluger, Alois, to Polysius AG. Conveyor axle for a traveling grate. 3,870,100, Cl. 165-89.000.
Kossuth, Donald A.: *See—*
Burkard, Edward A.; and Kossuth, Donald A., 3,870,538.
Kostelecky, Clarence L.: *See—*
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,869,978.
Kotick, Michael Paul; and Polazzi, Joseph Odo, to Miles Laboratories, Inc. 2-Halogeno-2-deoxy-5-(substituted)uridines. 3,870,700, Cl. 260-211.50R.
Koury, Ronald William; and Cooper, Marvin. Cup with beverage concentrate container. 3,870,220, Cl. 229-1.50C.
Kovalev, Petr Vasilievich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.
Kowa Company Ltd.: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,870,698.
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, to Shinetsu Chemical Company. Cellulose ether compositions useful as enteric coatings. 3,870,702, Cl. 260-226.000.
Kraft, Gerald A., to Philip Morris Incorporated. Air system control. 3,870,070, Cl. 137-512.000.
Kraft, Karl-Josef: *See—*
Diehr, Hans-Joachim; Kraft, Karl-Josef; and Sachs, Hanns Immo, 3,870,665.
Kraftwerk Union Aktiengesellschaft: *See—*
Schettler, Kurt, 3,870,636.
Kramer, Edward J. Clusterable learning module. 3,869,992, Cl. 108-60.000.
Kranz, Richard, to Tension Envelope Corporation. Method and apparatus for producing articles having a pocket containing a removable insert. 3,869,964, Cl. 93-61.00A.
Kratcoski, Francis L.; and Willemse, Adrianus H., to Oce-van der Grinten N.V. Photoprint developing apparatus and method. 3,870,017, Cl. 118-637.000.
Kratz, Gunter: *See—*
Dannenmann, Paul; and Kratz, Gunter, 3,870,438.
Kraus, Theodore C., to Olin Corporation. Catalytic preparation of formanilide. 3,870,758, Cl. 260-562.00R.
Krause, Gerhard, to Siemens Aktiengesellschaft. Integrated attenuation element comprising semiconductor body. 3,870,976, Cl. 333-81.00R.
Krause, Herbert, to Atwood Vacuum Machine Company. Hinging system for automobile doors with hinge halves welded to body and door. 3,870,361, Cl. 296-146.000.
Kreeger, Elsmer W.: *See—*
Sanders, Ellsworth E.; and Kreeger, Elsmer W., 3,870,185.
Kreibich, Walter: *See—*
Brede, Uwe; Flach, Karl-Egon; Gawlick, Heinz; Hirschmann, Gunter; and Kreibich, Walter, 3,870,894.
Kreuz, Otto; and Raab, Stephan, to Demag Aktiengesellschaft. Method for the accurate weight casting of metal plates. 3,870,097, Cl. 164-4.000.
Kriele, Ulrich: *See—*
Aignesberger, Alois; Kriele, Ulrich; and Michaud, Horst, 3,870,671.
Krings, Josef. Casing element for excavation casing. 3,869,867, Cl. 61-41.00A.
Kristian Gerhard Jebsen: *See—*
Aralt, Per Tybring, 3,870,168.
Kruckenberg, Perry Lester: *See—*
Anderson, Harold Elden; and Kruckenberg, Perry Lester, 3,870,025.
Kruder, George A., to Koehring Company. Extruder screws. 3,870,284, Cl. 259-191.000.
Kruper, Aloys, to Gebr. Cramer, Firma. Gas heated grill device. 3,870,031, Cl. 126-39.00J.
Krusche, Kurt. Brush with rotatable brush plate. 3,869,748, Cl. 15-172.000.
Kryger, Allen C.; Nevin, Charles S.; and Wilhelm, Donald L., to A. E. Staley Manufacturing Company. Granular starch-based gums. 3,870,527, Cl. 106-2.000.
Krzyminski, Harald, to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler. Process for boriding refractory metals and their alloys. 3,870,569, Cl. 148-6.000.
Kubota, Hayato; Nakayama, Sadao; and Tateishi, Teizaburo, to Fuji Oil Company, Ltd. Mixtures of glycerides having cyto-c22 fatty acid content. 3,870,733, Cl. 260-410.800.
Kubota, Katuhiko: *See—*
Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, 3,870,944.
Kubotera, Kikuo; Ikenoue, Shinpei; Mizuki, Eiichi; and Fujiwara, Tadahiro, to Fuji Photo Film Co., Ltd. Lithographic type diffusion transfer developer. 3,870,479, Cl. 96-29.00L.
Kudo, Shinji, to Yodogawa Steel Works, Limited. Laminated metal-based facing. 3,870,594, Cl. 161-165.000.
Kuehner, Richard, to Borg-Warner Corporation. Refrigeration system utilizing ice slurries. 3,869,870, Cl. 62-114.000.
Kuhlman Corporation: *See—*
Broverman, Alvin Y., 3,870,932.
Kuhn, George B., to Goodyear Tire & Rubber Company, The. Method of making a foam package. 3,870,741, Cl. 264-46.400.
Kuhn, Harold C.: *See—*
Polk, Isaac H., 3,870,212.
Kuhr, Johann: *See—*
Hofel, Heinz-Bernard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,669.
Hofel, Heinz-Bernhard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,670.
Kukucka, William P., to Xerox Corporation. Sorter supplement control. 3,870,295, Cl. 271-173.000.
Kuleshov, Roman Stepanovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.
Kummerer, Richard A.: *See—*
Wildman, Claude L.; and Hellmer, George A., 3,869,856.
Kump, Shirl R.: *See—*
Lee, George W., 3,870,278.
Kurei, Hiroshi: *See—*
Nomura, Katsuhiko; Kurei, Hiroshi; and Urano, Fumio, 3,871,011.
Kurohara, Hiroyoshi: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.
Kuroyanagi, Yoshitaka: *See—*
Uchida, Yasuo; and Kuroyanagi, Yoshitaka, 3,871,005.
Kusama, Mikio, to Daimei Tsushin Sangyo Kabushiki Kaisha. Portable tester for telephone subscriber lines. 3,870,836, Cl. 179-175.30R.
Kusayama, Seiji; Ohashi, Koichi; and Takada, Shinzo, to Sumitomo Chemical Company, Limited. Two-component adhesive. 3,870,675, Cl. 260-32.80A.
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. X-ray tube. 3,870,915, Cl. 313-32.000.
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. X-ray tube. 3,870,916, Cl. 313-32.000.
Kussemaul, Ernest A.: *See—*
Groce, Raymond; and Kussemaul, Ernest A., 3,870,963.
Kyle, Nanse R., to Hughes Aircraft Company. Tandem furnace crystal growing device. 3,870,473, Cl. 23-273.0SP.
L. & C. Steinmuller G.m.b.H.: *See—*
Kall, Horst; and Riedel, Klaus, 3,870,493.
La Salle Machine Tool, Inc.: *See—*
Vandenkieboom, John, 3,869,947.
La Technique Integrale: *See—*
Taillardat, Jacques, 3,869,936.
Laass, Heinz, to Taco-Tafel GmbH Co., KG. Overvoltage protected, battery powered electric circuit tester. 3,870,950, Cl. 324-51.000.

Labelle, Harold E., Jr., to Tyco Laboratories, Inc. Optical control of crystal growth. 3,870,477, Cl. 23-301.0SP.

Laboratories Medicoplast: *See—*
Viguier, Leon Fernand, 3,870,042.

Lacchia, Adrien, to Air-Industrie. Nozzle for projecting powdered solid products. 3,870,232, Cl. 239-15.000.

La Conti, Anthony B.: *See—*
Dempsey, Russell M.; Nolan, Mary E.; La Conti, Anthony B.; and Torkildsen, Robert A., 3,870,616.

Lacroix, Armand Jean-Baptiste; Quillevere, Herve Alain; Cantaloube, Bernard Andre; and Caruel, Jacques Emile Jules, to Societe National D'Etude et de Construction de Moteurs D'Aviation. Devices for prevaporising liquid fuel. 3,869,865, Cl. 60-39.660.

Ladin, Eli M., to Federal-Mogul Corporation. Preloading and sealing system for clutch bearings. 3,870,384, Cl. 308-187.200.

Lahaye, Jacques: *See—*
Bonnemay, Maurice; Bronoel, Guy Rene; Donnet, Jean-Baptiste; Lahaye, Jacques; and Sarradin, Joel Alain, 3,870,565.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Gardent, Maurice; Michalak, Wadislaw; and Prost, Roger, 3,869,876.

Laitram Corporation, The: *See—*
Lapeyre, James M.; and Lapeyre, Fernand S., 3,870,141.

Laizerovich, David: *See—*
Avakian, Emik; and Laizerovich, David, 3,870,385.

Lampert, Fred: *See—*
Hofel, Heinz-Bernard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,669.
Hofel, Heinz-Bernhard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,670.

Landrith, James Edward, to Van Dyk Research Corporation. Xerographic toner concentration control apparatus. 3,870,197, Cl. 222-52.000.

Landwehr, Hermann H. Volume and temperature regulating faucet. 3,870,080, Cl. 137-636.400.

Landy, Jerome J. Filter and seal. 3,870,490, Cl. 55-355.000.

Langenbach, Erwin: *See—*
Walter, Arthur A. W.; and Langenbach, Erwin, 3,870,878.

Langstroth, Theodore A., to Sterling Drug Inc. Process for comminuting fluorescent whitening agents and compositions obtained thereby. 3,870,649, Cl. 252-301.30W.

Lapeyre, Fernand S.: *See—*
Lapeyre, James M.; and Lapeyre, Fernand S., 3,870,141.

Lapeyre, James M.; and Lapeyre, Fernand S., to Laitram Corporation, The. Modular belt. 3,870,141, Cl. 198-193.000.

Laporte Industries Limited: *See—*
Robinson, Michael; Wilson, Harry Brian; and Gray, David Antony, 3,870,506.

Lapp, Ellsworth W., to Kinroth & Son Mfg. Co. Conduit bender. 3,869,917, Cl. 72-304.000.

Lara S.A.: *See—*
Edouard, Pierre Paul, 3,869,844.

Large, Richard L., to RVL Industries, Inc. Tray attachment for wheelchairs. 3,870,362, Cl. 297-155.000.

Larionov, Igor Naumovich; and Chernetsky, Tom Pavlovich. Method of connecting electrically conducting bodies. 3,870,850, Cl. 219-85.000.

Larkin, Sam. Shoring apparatus. 3,870,268, Cl. 248-354.00P.

Larsen, Robert T., to Outboard Marine Corporation. Rotary mower having quiet cutter blade. 3,869,848, Cl. 56-295.000.

Larsen, Robert T., to Outboard Marine Corporation. Snowmobile motor mounting. 3,870,117, Cl. 180-64.00R.

Larson, Paul E., to GCA Corporation. Esca x-ray source. 3,870,882, Cl. 250-305.000.

Larson, Raymond George. Self-contained light source device for center mounting of photographic reflector. 3,870,874, Cl. 240-1.300.

Lartigau, Guy: *See—*
Bost, Pierre-Etienne; Costantini, Michel; and Lartigau, Guy, 3,870,729.

Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., to GTE Sylvania Incorporated. Method of incorporating amalgam-forming material in a fluorescent lamp. 3,869,772, Cl. 29-25.130.

Laub, Herman, III. Antidrip volumetric rapid filling machine. 3,870,089, Cl. 141-44.000.

Laurenti, Italo Marco Levi. Finger grip-contoured molded scissors. 3,869,792, Cl. 30-254.000.

Laurier Associates, Inc.: *See—*
Hargraves, Don, 3,870,196.

Lautier, Gabriel T. Apparatus for manufacturing composite rovings. 3,869,758, Cl. 19-153.000.

Lautzenheiser, Robert D.; and Ullman, Howard M., Jr., to Red Cross Manufacturing Corporation, The. Detachable loading device for garden shredder. 3,870,239, Cl. 241-186.00R.

Lavoie, Girard H.: *See—*
Adamski, Joseph A.; Weiner, Joseph R.; and Lavoie, Girard H., 3,870,472.

Lawlor, Robert E.; Watson, Carlton B., Jr.; and McGill, Michael E. Golf swing training device. 3,870,315, Cl. 273-186.00R.

Lawrence, James Rogers, to Steadley Company, Incorporated. Bed base for supporting a box spring. 3,869,738, Cl. 5-200.00R.

Lawrence Peska Associates, Inc.: *See—*
Hanley, John J., 3,870,132.

Lax, Jacob; and Goldner, Sandor. Automotive anti-theft device. 3,870,895, Cl. 307-10.0AT.

Lazaroiu, Dumitru Florian; Sleiher, Sigmund; and Mihaiescu, Gheroghe Mihai, to Institutul De Cercetare Si proiectare Pentru Industria Electrotechnica. Method of making a disk or cup rotor. 3,869,788, Cl. 29-597.000.

Lear Siegler Inc.: *See—*
Surletta, Zygmunt M., 3,869,740.

Leblanc, Henry J., Sr.: *See—*
Wilson, Fred V.; and Leblanc, Henry J., Sr., 3,870,615.

Le Cloarec, Albert Y.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,870,728.

Lednov, Viktor Andreevich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.

Lee, George W., to Booker, Arnold Bryce; and Kump, Shirl R. Telescoping stand jack. 3,870,278, Cl. 254-98.000.

Lee, Robert Stormo, to Deere & Company. Method of producing spheroidal graphite cast iron. 3,870,512, Cl. 75-130.00R.

Leguy, Bernard: *See—*
Vignaud, Jean-Pierre; and Leguy, Bernard, 3,869,946.

Lehigh Industries, Inc.: *See—*
Senk, Herman W.; and Resnik, Bernard S., 3,869,763.

Lehmann, Helmut: *See—*
Jores, Willi; Hoffacker, Franz; and Lehmann, Helmut, 3,870,584.

Leidy, William S.; and Scheller, Donald M., to McDonnell Douglas Corporation. Aircraft vectored flight control means. 3,870,253, Cl. 244-46.000.

Leiter, Leigh David: *See—*
Hardiman, Russell J.; Leiter, Leigh David; and Valle, Howard C., 3,870,263.

Lemelson, Jerome H. Assembly toy and craft. 3,869,824, Cl. 46-17.000.

Lemont, Harold Edminston, to Hughes Tool Co. Hoist drive system. 3,870,255, Cl. 244-137.000.

Lenz, Josef. Air vent head, especially for ship's tanks. 3,869,967, Cl. 98-61.000.

Leonard Lebowitz: *See—*
Bergsman, Robert Paul, 3,870,842.

Leroy, Maurice, to Societe anonyme dite: Richier. Compaction of a surface with a compactor having wheels. 3,870,226, Cl. 235-151.300.

Les Produits Associes: *See—*
Moret, Michel Antoine Cesar; and Jousson, Pierre Jean, 3,870,039.

Lever Brothers Company: *See—*
Tombs, Michael Peter, 3,870,801.

Levitsky, Vladimir Konstantinovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Levy, Howard M. Water current or tide direction-of-flow indicator. 3,869,911, Cl. 73-170.00A.

Leyman Manufacturing Corporation: *See—*
Himes, William H., 3,870,126.

Liautaud, Jean Alphonse Eugene, to Subsea Equipment Associates Limited. Tight underwater connector. 3,870,345, Cl. 285-24.000.

Liddell, Orval E. Protective covering apparatus for a submerged structure. 3,870,009, Cl. 114-222.000.

Liebig, Preston Dean: *See—*
Hurlbut, William Barrett, Sr.; Liebig, Preston Dean; and Maurin, Gerald, 3,870,487.

Liljenzin, Jan-Olov; Reinhardt, Hans; and Rydberg, Helge Jan Arnold, to Stora Kopparbergs Bergslags Aktiebolag. Method of removing monovalent inorganic acids from an aqueous solution containing metal salts of the acids. 3,870,060, Cl. 134-3.000.

Lilly Industries Limited: *See—*
Hughes, Peter Graham; and Verge, John Pomfret, 3,870,725.

Lin, Paul T. C.; and Winter, Edwin M., to International Business Machines Corporation. Flip chip module with non-uniform connector joints. 3,871,015, Cl. 357-67.000.

Linde Aktiengesellschaft: *See—*
Abels, Theodor; and Puschel, Siegfried, 3,870,935.

Lindemann, Hans-Joachim. Insufflation apparatus for introducing limited quantities of carbon dioxide into the human body for operative purposes. 3,870,072, Cl. 137-557.000.

Litwin, William J. Portable power saw guide. 3,869,951, Cl. 83-745.000.

Lobbe, Armin, to Gewerkschaft Eisenhutte Westfalia. Device for use with tunnel driving machines. 3,870,369, Cl. 299-71.000.

Lodal Inc.: *See—*
Brisson, John R., 3,870,174.

Loeffel, Hansrolf: *See—*
Froehlich, Alfred; and Loeffel, Hansrolf, 3,870,697.

Lofgren, Stig Tore Johannes, to Innovare I Taby Aktiebolag. Self-locking corner joint for the walls of cupboard-like structures. 3,870,388, Cl. 312-257.00A.

Logan, Noel. Combination threading and screw driver tool. 3,869,741, Cl. 7-17.000.

Lomax, Harold R.; and Potts, Bobby K. Apparatus for trimming plumbing pipes below floor level. 3,870,429, Cl. 408-1.000.

Loncaric, Rado G., to Atlantic Richfield Company. Crack arrester system. 3,870,350, Cl. 285-286.000.

London, Arnold B.; and Nessel, Jiri, to London, Arnold B., by said Jiri Nessel. Cleaning apparatus. 3,869,749, Cl. 15-302.000.

London, Arnold B.: *See—*
London, Arnold B.; and Nessel, Jiri (said Jiri Nessel assors. to), 3,869,749.

Long, Terry: *See—*
Gosling, William Robert Frederick; Wakefield, David John; and Long, Terry, 3,870,106.

Loop A Line, Inc.: *See—*
McGahee, Welbourne D., 3,869,821.
McGahee, Welbourne D., 3,870,343.

Lorain Products Corporation: *See—*
Kiko, Frederick, 3,870,896.

Lose, John G.; and Roth, John F., to Gulf & Western Industrial Products Company. Geared drag link-slider-crank press. 3,869,927, Cl. 74-44.000.

Losensky, Erich: *See—*
Kipke, Eberhard; and Losensky, Erich, 3,870,912.

Loucas, Spiro P.: *See—*
Haddad, Heskel M.; and Loucas, Spiro P., 3,870,791.

Louisiana-Pacific Corporation: *See—*
Johnson, Waldo O.; and Walters, Rodney P., 3,869,839.

Love, Roy E., to Corning Glass Works. Passive coupler for optical communication system. 3,870,398, Cl. 350-96.00C.

Lovelock, James Ephraim. Electron capture detectors. 3,870,888, Cl. 250-384.000.

Loveshaw Corporation, The: *See—*
Groce, Raymond; and Kussemaul, Ernest A., 3,870,963.

Lowery, James I. Automobile mounted shelter. 3,870,061, Cl. 135-5.00A.

Lowey, Hans; and Stafford, Herbert Henry, to Forest Laboratories, Inc. Solid pharmaceutical formulations containing hydroxypropyl methyl cellulose. 3,870,790, Cl. 424-19.000.

Lubrizol Corporation, The: *See—*
Shumaker, Gary Allen, 3,870,560.

Lucas Aerospace Limited: *See—*
Bunn, George Edward, 3,869,864.

Luckenbill, Lawrence F.; and Ellis, Daniel A., to Mueller Co. Cutter for plastic pipe and drilling tool. 3,870,431, Cl. 408-111.000.

Luczkiw, John, to Viceroy Manufacturing Company Limited. Closure for liquid containers. 3,870,183, Cl. 215-247.000.

Luganski, Dimitri: *See—*
Biagi, Alvaro D.; and Luganski, Dimitri, 3,870,993.

Lundberg, Robert D. Novel foamed multiphase thermoplastic copolymer compositions. 3,870,662, Cl. 260-2.50R.

Lundberg, Robert D.: *See—*
Makowski, Henry S.; Lundberg, Robert D.; and Singhal, Gopal H., 3,870,841.

Lussling, Theodor; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Process for recovery of pure acetonitrile. 3,870,746, Cl. 260-465.300.

Luzaich, Samuel, to Ecodyne Corporation. Cooling tower. 3,870,773, Cl. 261-111.000.

Lycan, Goodwin A. Gauge for measuring the degree of alignment at the inner surfaces of two tubular members positioned end to end. 3,869,801, Cl. 33-174.00R.

Lydle, John E.; and Yakubik, Charles F., to Thermo-Rite Mfg. Co., The. Fireplace front or screen. 3,870,032, Cl. 126-202.000.

Lyth, William W.: *See—*
Wilhelm, Frederick R.; Hastings, Donald R.; and Lyth, William W., 3,870,233.

M & F Chemicals Inc.: *See—*
Seyb, Edgar J., Jr.; and Woehrle, Richard E., 3,870,618.

Maack, David Ralph: *See—*
Peoples, Dennis Robert; and Maack, David Ralph, 3,870,977.

MacDonald, Paul M., to P.X. Industries, Inc. Self-locking shelf support. 3,870,266, Cl. 248-235.000.

Machida, Hazime; and Okuno, Zenjiro, to Kabushiki Kaisha Ricoh. Liquid developer for plural-color electrophotography. 3,870,644, Cl. 252-62.100.

Machii, Tetsuo: *See—*
Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, 3,870,944.

Mackey, E. Scudder; Pechmann, Karl; and Tritten, Donald E., to GAF Corporation. Photographic overcoat composition of an alkenyl half ester of starch. 3,870,521, Cl. 96-67.000.

Mackintosh, Charles. Drawer-type grandstand arrangement. 3,869,835, Cl. 52-9.000.

MacMillan, Donald Stuart; and Churchward, Leonard, to Polyurcon Limited. Device with attached grab line. 3,869,744, Cl. 9-340.000.

Macovei, Alexandru A.: *See—*
Cadariu, Emil E.; and Macovei, Alexandru A., 3,870,037.

Maderno, Cesano: *See—*
Siclari, Francesco; Maderno, Cesano; Magnoni, Franco; and Fulmini, Sergio, 3,870,475.

Madison, Ernst Michael Gyorgy: *See—*
Dillon, Joseph Francis, Jr.; Madison, Ernst Michael Gyorgy; and Van Uitert, Legrand Gerard, 3,870,397.

Maeda, Chiaki: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Maeda, Hiroaki: *See—*
Miyao, Takayuki; and Maeda, Hiroaki, 3,869,939.

Magnoni, Franco: *See—*
Siclari, Francesco; Maderno, Cesano; Magnoni, Franco; and Fulmini, Sergio, 3,870,475.

Majors, Eric Desmond Thomas; and Davey, John Kenneth, to Cope Allman Plastics Limited. Machines for moulding hollow bodies from synthetic resin. 3,870,448, Cl. 425-242.00B.

Makimura, Osamu; and Goto, Teruo, to Toyoboseki Kabushiki Kaisha. Titanium tartrate catalyzed polyesterification. 3,870,688, Cl. 260-75.00R.

Makowski, Henry S.; Lundberg, Robert D.; and Singhal, Gopal H., to Exxon Research and Engineering Company. Flexible polymeric compositions comprising a normally plastic polymer sulfonated to about 0.2 to about 10 mole % sulfonate. 3,870,841, Cl. 260-23.70R.

Malarkey, John M.: *See—*
Wilson, David G.; Hanson, Brian D.; and Malarkey, John M., 3,870,127.

Malaviya, Shashi D., to International Business Machines Corporation. Phase discriminator having unlimited capture range. 3,870,900, Cl. 307-232.000.

Mallener, Helmut: *See—*
Brugger, Hans; and Mallener, Helmut, 3,870,572.

Mallet, Alfred L., to Sanders Associates, Inc. Underwater direction signal processing system. 3,870,989, Cl. 340-6.00R.

Mallory, Roy E., to MBR Corporation. Environmental chamber. 3,870,873, Cl. 240-1.100.

Malmin, Oscar. Instrument exchanger. 3,869,797, Cl. 32-40.00R.

Man-king, Law. Hydraulic toothbrush. 3,869,746, Cl. 15-29.000.

Manecke, Siegfried E., to Robertshaw Controls Company. Thermostat construction and electrical control system utilizing the same. 3,870,229, Cl. 337-57.000.

Mangold, Dietrich: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,870,740.

Mann, Seymour, to Aceto Chemical Co., Inc. Method of preventing ingestion of lead base paint coatings. 3,870,550, Cl. 117-84.000.

Mannesmann Aktiengesellschaft: *See—*
Monreal, Karl; and Schwitzgobel, Rudolf, 3,870,571.

Manning, James D., Jr. Swingable, demountable mailbox support. 3,870,262, Cl. 248-145.000.

Manno Kogyo Kabushiki Kaisha: *See—*
Iida, Hiroshi, 3,869,897.

Marcellis, Alphonso W.: *See—*
Kerschner, Paul M.; and Marcellis, Alphonso W., 3,870,643.

Marcellus, Richard B. Portable electrically illuminated book. 3,869,818, Cl. 40-31.000.

Marconi Company Limited, The: *See—*
Baxter, Roderick Carey; and Hart, Dennis Edward, 3,870,979.

Marcotti, Egidio: *See—*
Rivetta, Gianfranco; and Marcotti, Egidio, 3,870,840.

Marechal, Claude, to Ciments Lafarge S.A. Process and device for the quantitative analysis of free lime. 3,870,465, Cl. 23-230.00A.

Marek, Josef: *See—*
Arledter, Hanns F.; and Marek, Josef, 3,870,054.

Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Thermal power plant. 3,869,857, Cl. 60-39.18R.

Maroschak, Ernest J. Pipe doffing and bundling method. 3,870,774, Cl. 264-40.000.

Marsan Manufacturing Company, Inc.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.

Marsch, Hans-Dieter. Device for performing catalytic endothermic reactions. 3,870,476, Cl. 23-289.000.

Marshall, John Stephen, to Sperry Rand Limited. Fluid-tight seals and methods of making them. 3,870,322, Cl. 277-167.500.

Marshall, William E.: *See—*
Hayes, John T., Jr.; and Marshall, William E., 3,870,812.

Marspring Corporation: *See—*
Klein, Donald L., 3,869,739.

Martel, Jacques; Toromanoff, Edmond; and Buendia, Jean, to Roussel-Uclaf. Cyclopentanone derivatives. 3,870,710, Cl. 260-240.00R.

Martel, Jacques; Buendia, Jean; and Toromanoff, Edmond, to Roussel-UCLAF. Preparation of prostanoic acid derivatives. 3,870,711, Cl. 260-240.00R.

Martin, Daniel; and Vayssiere, Pierre, to Institut de Recherches de la Siderurgie Francaise (IRSID). Method for the introduction of solid products. 3,870,510, Cl. 75-61.000.

Martin, Roger W.: *See—*
Faylor, Terry Lee; and Martin, Roger W., 3,870,033.

Marvin Glass & Associates: *See—*
Meyer, Burton C.; and Glass, Marvin I., 3,870,307.

Maschinenfabrik Wifag: *See—*
Schmid, Jurg Friedrich, 3,870,214.

Mason, James A., Jr.: *See—*
Carr, George P.; and Mason, James A., Jr., 3,869,896.

Mason, Peter John, to Xerox Corporation. Optical system for transmit/receive mode conditioning of facsimile transceivers. 3,870,816, Cl. 178-7.600.

Massachusetts Institute of Technology: *See—*
Pratt, George W., Jr., 3,871,017.

Masuda, Takao: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 3,870,523.
Mathers, James E.: *See—*
Ferri, John L.; and Mathers, James E., 3,870,650.
Mathews, Carl S.; and Swagerty, Arnold, to A-T-O Inc. Communications via loran navigation pulses. 3,870,999, Cl. 343-103.000.
Mathieu, Raymond, to Thomson-CSF. Mechanical device for converting a continuous rotary motion into an alternating rotary motion. 3,869,935, Cl. 74-322.000.
Matsuki, Norio, to Sumitomo Metal Industries Limited. Threaded tube joint structure for casing, particularly oil well tubing. 3,870,351, Cl. 285-334.000.
Matsumoto Keishin, Director General of the Agency of Industrial Science and Technology: *See—*
Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, 3,870,603.
Matsumoto, Mitsuo M. Planter package. 3,869,828, Cl. 47-34.110.
Matsunaga, Tsutomu: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; and Yoneyama, Ken, 3,870,551.
Matsuo, Yoshio: *See—*
Toyama, Shigetaro; and Matsuo, Yoshio, 3,870,231.
Matsuoka, Seiichi: *See—*
Yamamoto, Kenzo; Matsuoka, Seiichi; and Shioda, Toshio, 3,870,738.
Matsuoka, Shigeru: *See—*
Ikenga, Junichi; Matsuoka, Shigeru; and Okabe, Yoshio, 3,870,941.
Matsushita Electric Industrial Co., Ltd.: *See—*
Kato, Nobuo; Nakamura, Toshio; and Terakado, Seishi, 3,870,983.
Oka, Shunzo; and Nishioka, Matsuo, 3,870,986.
Ota, Isao; and Otsuka, Tetsuro, 3,870,517.
Shibano, Takashi; Hirakawa, Koichi; and Yonehara, Toshimitsu, 3,870,982.
Mattera, Henry A. Wave operated power plant. 3,870,893, Cl. 290-53.000.
Matthews, Oliver Charles, to Post Office, The. Supplying a charging current by way of telephone lines or the like. 3,870,822, Cl. 179-4.000.
Mattila, Robert O.: *See—*
Tuomela, Robert M.; Schroeder, Gustave W.; and Mattila, Robert O., 3,870,111.
Mattis, Donald J.: *See—*
Horwitt, Laurence G.; and Mattis, Donald J., 3,870,857.
Maurin, Gerald: *See—*
Hurlbut, William Barrett, Sr.; Liebig, Preston Dean; and Maurin, Gerald, 3,870,487.
Maust, Daniel A.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.
May, Donald L., to J. E. Love Company. Bat construction for a harvester reel. 3,869,847, Cl. 56-220.000.
Mayberry, Leonard A. Method and apparatus for testing the pulse permeability of laminae of core laminations. 3,870,949, Cl. 324-34.0PE.
Mayer & Cie Maschinenfabrik: *See—*
Brunner, Heinz, 3,869,879.
Mayfran Incorporated: *See—*
Schock, Delmas A., 3,870,904.
Mazur, Harry E. Camera carrying device. 3,870,209, Cl. 224-5.00V.
Mazzella, John A.; and Mazzella, Joseph S. Heavy-duty wire-net structure. 3,870,256, Cl. 245-8.000.
Mazzella, Joseph S.: *See—*
Mazzella, John A.; and Mazzella, Joseph S., 3,870,256.
MBR Corporation: *See—*
Mallory, Roy E., 3,870,873.
McCain, David L.: *See—*
Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., 3,870,373.
McCarley, William I. Telephone hold circuit. 3,870,831, Cl. 179-99.000.
McClocklin, Samuel B.: *See—*
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,869,978.
McCormick, Joseph L.; McMullen, Charles G.; and Woodall, Phillip J., to Bendix Corporation, The. Geographic addressing by interrogation for controlling airport ground traffic. 3,870,994, Cl. 343-6.50R.
McCoy, Frederic C.; and Cole, Edward L., to Texaco Inc. Alkylation aids. 3,870,765, Cl. 260-683.510.
McCulloch Corporation: *See—*
Anderson, Harold Elden; and Kruckenberg, Perry Lester, 3,870,025.
McCullough, Robert W., to Deering Milliken Research Corporation. Tight warp detector. 3,869,770, Cl. 28-51.000.
McDonald, John C.: *See—*
Baichtal, James R.; and McDonald, John C., 3,870,824.
McDonnell Douglas Corporation: *See—*
Dueker, James E.; and Brunkhorst, Lloyd E., 3,870,887.
Leidy, William S.; and Scheller, Donald M., 3,870,253.
McGahee, Welbourne D., to Loop A Line, Inc. Connector combined with fishing float, leader, sinker, or lure apparatus. 3,869,821, Cl. 43-42.490.
McGahee, Welbourne D., to Loop-A-Line, Inc. Trailer hitch and safety connector. 3,870,343, Cl. 280-457.000.
McGill, Michael E.: *See—*
Lawlor, Robert E.; Watson, Carlton B., Jr.; and McGill, Michael E., 3,870,315.
McGowan, Gerald: *See—*
Dennis, Roderick A.; Consiglio, Thomas J.; and McGowan, Gerald, 3,870,819.
McGuire, Michael T.: *See—*
Capossela, Anthony C.; McGuire, Michael T.; Smith, Gordon C.; and Albaum, Joseph D., 3,870,806.
McKay, Alexander S., to Texaco Exploration Canada Ltd. Means and method for providing an output corresponding to the expected subsidence of a frozen earth formation. 3,870,879, Cl. 250-269.000.
McLarnon, J. Stanley. Pipe fabrication jig. 3,870,288, Cl. 269-45.000.
McMahon, John. Gas spring. 3,870,287, Cl. 267-113.000.
McMahon, John F., to Metalized Ceramics Corporation. Method for making ceramic-metal structures. 3,870,776, Cl. 264-61.000.
McMullen, Charles G.: *See—*
McCormick, Joseph L.; McMullen, Charles G.; and Woodall, Phillip J., 3,870,994.
McNaught, Colin J.: *See—*
Higham, John D.; and McNaught, Colin J., 3,869,892.
McNicol, Douglas. Oyster culture basket. 3,870,019, Cl. 119-4.000.
McSwain, Thad M. Flexible bag holder. 3,870,261, Cl. 248-101.000.
Mead Corporation, The: *See—*
Baker, Jesse L., 3,869,830.
Wyant, Jon Richard, 3,870,223.
Mead, Theodore C.: *See—*
Ashton, William B.; Gonzalez, Luis A.; Nelson, Gerald V.; and Mead, Theodore C., 3,870,622.
Meade, Hazel W.: *See—*
Blanco, Louis A.; and Meade, Hazel W., 3,870,536.
Meads, Charles D., to DICO Company, Inc. Adjustable material handling fork. 3,870,356, Cl. 294-67.00A.
Measurex Corporation: *See—*
Higham, John D., 3,869,891.
Higham, John D.; and McNaught, Colin J., 3,869,892.
Medico, Christine: *See—*
Medico, John J., Jr., 3,870,422.
Medico, John J., Jr., to Medico, Christine. Porous pavement. 3,870,422, Cl. 404-31.000.
Medlin, Richard Larry. Illuminated pavilion umbrella. 3,870,062, Cl. 135-20.00M.
Meier, Rene: *See—*
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 3,870,714.
Merck & Co., Inc.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,870,753.
Wendler, Norman L.; Taub, David; Slates, Harry L.; and Zelawski, Zbigniew S., 3,870,747.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,870,757.
Merigoux, Henri; Darces, Jean-Francois; and Exertier, Jean-Yves, to Merigoux, Henri. Process and device for studying the structure of single crystals. 3,870,880, Cl. 250-273.000.
Merit Metal Products Corp.: *See—*
Biscardi, Charles T., 3,870,355.
Merker, Steven L.: *See—*
Heitkamp, Norman D.; Merker, Steven L.; and Stungis, George E., 3,870,053.
Merrell, Franklin O., to Northrop Corporation. Ice Floor. 3,870,587, Cl. 161-37.000.
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Tymann, Gerhard, 3,871,000.
Metalized Ceramics Corporation: *See—*
McMahon, John F., 3,870,776.
Metivier, Robert. Pressure drop alarm device. 3,870,012, Cl. 116-70.000.
Meto Corporation: *See—*
Abel, Donald J., 3,870,103.
Mettler Instrumente AG: *See—*
Rellstab, Werner; and Steiner, Hans, 3,870,466.
Mewissen, Jan Alfons Catharina: *See—*
De Fraeye, Dirk Jules Remi; and Mewissen, Jan Alfons Catharina, 3,870,920.
Meyer, Burton C.; and Glass, Marvin I., to Marvin Glass & Associates. Pin ball game apparatus. 3,870,307, Cl. 273-121.00A.
Meyer, Engelbert A., to USM Corporation of Flemington, New Jersey. Retaining clip formed from sheet material. 3,869,760, Cl. 24-73.000.
Meyer, Norbert; Oei, Han Yong; Rausch, Werner; and Schneider, Horst, to Oxy Metal Finishing Corporation. Method of treating iron and steel workpieces prior to cold working. 3,869,894, Cl. 72-42.000.
Meylan, Geroges, to J. Bobst & Fils S.A. Apparatus for separating and stacking blanks. 3,870,213, Cl. 225-100.000.
Michalak, Wadislaw: *See—*
Gardent, Maurice; Michalak, Wadislaw; and Prost, Roger, 3,869,876.

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Aignesberger, Alois; Kriele, Ulrich; and Michaud, Horst, 3,870,671.
Micka, John J.: *See—*
Fuchs, Thomas D.; and Micka, John J., 3,870,184.
Micron Engineering Inc.: *See—*
Holl, Richard Adolf, 3,870,082.
Middendorf, John E.: *See—*
Boyer, Robert A.; and Middendorf, John E., 3,870,808.
Mihaiescu, Gheroghe Mihai: *See—*
Lazaroiu, Dumitru Florian; Sleiher, Sigmund; and Mihaiescu, Gheroghe Mihai, 3,869,788.
Mikat, Kurt W. Enhancement of morphologic detail in tissue. 3,870,789, Cl. 424-3.000.
Mile High Equipment Company: *See—*
Verlinden, Jerry M.; and Swinford, Gary D., 3,869,875.
Miles Laboratories, Inc.: *See—*
Elliott, Roderick Douglas, 3,870,046.
Kotick, Michael Paul; and Polazzi, Joseph Odo, 3,870,700.
Milke, Howard W.: *See—*
Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., 3,869,772.
Millauer, Christian: *See—*
Bausch, Gunther; Millauer, Christian; and Paul, Harald, 3,870,285.
Miller, Dorothy: *See—*
Chase, Bert, 3,869,972.
Miller, George A.; and Weiler, Ernest D., to Rohm and Haas Company. Stabilization of solutions of 3-isothiazolones employing certain metal nitrates and nitrites. 3,870,795, Cl. 424-270.000.
Miller, Gerald R., to Gabriel of Canada Limited. Shock absorber. 3,870,130, Cl. 188-288.000.
Miller, Harry A.: *See—*
Swidler, Ronald; Smith, Ray S.; and Miller, Harry A., 3,870,555.
Miller, Harry B., to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Yarn cutter for use in yarn winders. 3,870,240, Cl. 242-18.00A.
Miller, Raymond B., to United States of America, Navy. Jamming cancellation device. 3,870,996, Cl. 343-18.00E.
Miller, Wesley E. Latches. 3,870,353, Cl. 292-37.000.
Milligan, Barton: *See—*
DeLaMater, George B.; Herrick, Elbert C.; and Milligan, Barton, 3,870,739.
Mills, Thomas B., to National Semiconductor Corporation. Sound volume control circuit with sound level output linearly related to volume control potentiometer setting. 3,870,964, Cl. 330-29.000.
Minera, Salvador A. Huller for berries. 3,869,977, Cl. 99-640.000.
Minklei, Alfred O.; and Peterson, John A., to Hooker Chemicals & Plastics Corporation. Thermal shrinkage resistance of leather. 3,870,554, Cl. 117-138.000.
Minnesota Mining and Manufacturing Company: *See—*
Elton, Robert L.; and Vander Louw, John F., 3,870,593.
Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D., 3,870,682.
Fass, Leonard; and Fatuzzo, Ennio, 3,870,892.
Hunt, George R., 3,870,020.
Minnick, George D. Inflatable striking member and projectile dispensing receptacle. 3,870,304, Cl. 273-95.00R.
Minnick, Leonard John; Smith, Charles L.; and Webster, William C., to IV Conversion Systems, Inc. Method of treating coal mining refuse. 3,870,535, Cl. 106-118.000.
Minns, H. Gordon, Jr. Measuring system. 3,870,065, Cl. 137-93.000.
Minolta Camera Kabushiki Kaisha: *See—*
Takeuchi, Hideo, 3,871,006.
Mishima Kosan Co., Ltd.: *See—*
Takeuchi, Shinjiro; and Ichioka, Satoshi, 3,870,973.
Misjurev, Vladimir Ivanovich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.
Miskin, Richard B., to Miskin Scraper Works, Inc. Bale loader. 3,870,173, Cl. 214-152.000.
Miskin Scraper Works, Inc.: *See—*
Miskin, Richard B., 3,870,173.
Mississippi Chemical Corporation: *See—*
Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., Jr., 3,870,782.
Misu, Hiroshi: *See—*
Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, 3,870,524.
Mita, Ikuo, to Tokyo Metropolitan Government. Process for coloring aluminum or aluminum alloys by anodizing with imperfectly rectified current. 3,870,608, Cl. 204-58.000.
Mitchell, Lawrence C.; and Ter Haar, Gary L., to Ethyl Corporation. Smoke retardant vinyl halide polymers. 3,870,679, Cl. 260-45.75N.
Mitsubishi Chemical Industries Limited: *See—*
Kamo, Seiichi; Yanai, Noriyoshi; and Osako, Naoto, 3,870,755.
Mitsui Mining and Smelting Co., Ltd.: *See—*
Kojima, Hiromitsu, 3,870,169.
Mitsui, Ryozo: *See—*
Goto, Kenji; Mitsui, Ryozo; and Ishikawa, Norikatsu, 3,869,858.
Mitsui Shipbuilding and Engineering Co. Ltd.: *See—*
Izumi, Hitoshi, 3,870,123.
Miyamoto, Tadashi; and Iwahashi, Masaaki, to Wakayama Iron Works Ltd. Apparatus for treating fabrics with steam. 3,869,882, Cl. 68-5.00C.
Miyao, Takayuki; and Maeda, Hiroaki, to Aisin Seiki Co. Ltd. Hydromechanical transmission. 3,869,939, Cl. 74-687.000.
Miyauchi, Rin-Ichi; Saito, Bunjiro; and Ikeda, Kyoichi, to Yokogawa Electric Works, Ltd. Symmetrically arranged, deflection type differential pressure transmitters for controlling industrial systems and processes. 3,869,920, Cl. 73-398.00R.
Miyazaki, Koshin: *See—*
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi. Apparatus for separating fluids. 3,870,637, Cl. 210-243.000.
Mizuki, Eiichi: *See—*
Kubotera, Kikuo; Ikenoue, Shinpei; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,870,479.
Mizuno, William G., to Economics Laboratory, Inc. Treatment of fabrics in machine dryers. 3,870,145, Cl. 206-84.000.
Mizutani, Shoji: *See—*
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi, 3,870,637.
Mo, Olav. Storage-vessel. 3,870,003, Cl. 114-.50T.
Mobley, Loreley S.: *See—*
Fieser, Arthur H.; and Mobley, Loreley S., 3,870,570.
Modena, Mario; Ragazzini, Mario; Borsini, Giancarlo; and Valera, Marco, to Montecatini Edison S.p.A. Crystalline copolymers of ethylene and tetrafluoroethylene having high workability characteristics. 3,870,689, Cl. 260-87.50B.
Moeller, Bonde, to Geschafts-und Industriebau B. Moeller & Co. Framework for travelling crane. 3,870,159, Cl. 212-13.000.
Moen, George A. Fastener device. 3,869,959, Cl. 85-83.000.
Moisar, Erik; and Klotzer, Sieghart, to Agfa-Gevaert Aktiengesellschaft. Fogged, direct-positive emulsion containing heterodisperse and irregular composite silver halide grains. 3,870,522, Cl. 96-107.000.
Molins Limited: *See—*
Heybourn, Frank; and Hinchcliffe, Dennis, 3,870,143.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Sr., 3,870,867.
Monet, John E.; and Brunette, Fredrick, to Monet, John E. Display apparatus. 3,870,154, Cl. 211-74.000.
Mono Pumps (Engineering) Limited: *See—*
Hurst, William Edward, 3,870,283.
Monreal, Karl; and Schwitzgobel, Rudolf, to Mannesmann Aktiengesellschaft. Method for surface treatment of intermediate products which are being flame scarfed. 3,870,571, Cl. 148-9.500.
Monroe Electronics, Inc.: *See—*
Vosteen, Robert E.; and Williams, Bruce Theodore, 3,870,968.
Monsanto Company: *See—*
Blake, Edward S., 3,870,646.
Darrah, John W., III; and Williams, Dick W., 3,869,843.
Harris, Alva F.; and Shapras, Peter, 3,870,802.
Sincock, Thomas F., 3,870,181.
Montecatini Edison S.p.A.: *See—*
Modena, Mario; Ragazzini, Mario; Borsini, Giancarlo; and Valera, Marco, 3,870,689.
Moore, Francis C.; and Perkinson, Leon R., to Moore-Perk Corporation. Filtering device. 3,870,639, Cl. 210-359.000.
Moore-Perk Corporation: *See—*
Moore, Francis C.; and Perkinson, Leon R., 3,870,639.
Moran, John Christian: *See—*
Carbrey, Robert Lawrence; Moran, John Christian; and Tsao-Wu, Nelson Tsin, 3,870,826.
Moraw, Roland: *See—*
Schadlich, Gunther; and Moraw, Roland, 3,871,002.
Moret, Michel Antoine Cesar; and Jousson, Pierre Jean, to Les Produits Associes. Fractionated liquid jet. 3,870,039, Cl. 128-66.000.
Mori, Toshito: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,870,698.
Morisaki, Nobukazu, to Daido Metal Company, Ltd. Cassette-type bearing unit. 3,870,383, Cl. 308-82.000.
Moroz, Vitaly Iosifovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.
Morrissey, Everett G.: *See—*
Darnell, Robert S.; and Morrissey, Everett G., 3,870,513.
Morse, John F. Rudder control cable system. 3,870,007, Cl. 114-160.000.
Mortashed, Merle H., to Harbor Universal, Inc. File drawer interlock mechanism. 3,870,387, Cl. 312-218.000.
Moseley, Charles D., Jr. Water heating system. 3,870,228, Cl. 237-59.000.
Moshnin, Evgeny Nikolaevich; Romashko, Nikolai Ivanovich; Nikolaev, Vyacheslav Pavlovich; and Odnodushny, Viktor Alexeevich. Method of fabricating curved fittings and device for effecting same. 3,869,776, Cl. 29-157.00A.

Mosler Safe Company, The: *See—*
Woods, Thomas H.; and Voss, William M., 3,870,814.

Moss, Gerald, to Exxon Research and Engineering Company. Process and apparatus for the production of combustible gases. 3,870,480, Cl. 48-71.000.

Motiva, Ltd.: *See—*
Schwartz, Robert C.; and Burke, Frederick, 3,870,411.

Motomura, Hiroji: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Motorola, Inc.: *See—*
Caprio, Gerald L., 3,871,023.
Frederiksen, Thomas M., 3,870,965.
Wilcox, Milton E., 3,871,022.
Wisseman, Leo L., 3,870,967.

Mott, James D., to Hydril Company. Subsurface well apparatus and method. 3,870,102, Cl. 166-72.000.

Mott, James D., to Hydril Company. Subsurface safety valve well tool operable by differential annular pressure. 3,870,104, Cl. 166-224.00A.

Mount Hope Machine Company, Incorporated: *See—*
Gallant, James O.; Staples, Robert E.; and Knapp, George P., 3,869,774.

Moyle, Maurice: *See—*
Freure, Robert J.; and Moyle, Maurice, 3,870,683.

Mueller Co.: *See—*
Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,870,431.

Muller, Anton: *See—*
Schurle, Werner; and Muller, Anton, 3,870,094.

Muller, Peter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cleaning of open-end spinning turbines. 3,869,851, Cl. 57-58.890.

Mullin, George Cruise; Wetherby, Robert Earle; and Chevalier, Victor Oscar, to Avco Corporation. Coated abrasive articles having a surface deposit of fluorocarbon particles. 3,869,834, Cl. 51-295.000.

Mulvey, Thomas, to National Research Development Corporation, The. Magnetic lenses. 3,870,891, Cl. 250-398.000.

Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, to Kowa Company Ltd. Quintomycin compounds. 3,870,698, Cl. 260-210.0AB.

Munchbach, George Ernest: *See—*
Walton, Richard Rhodes; and Munchbach, George Ernest, 3,869,768.

Munzer, Manfred: *See—*
Fink, Herbert; Munzer, Manfred; and Dinklage, Horst, 3,870,557.

Murata, Hajime: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Murata, Yasuzo: *See—*
Watanabe, Akio; and Murata, Yasuzo, 3,870,435.

Muratov, Valeryan Matveevich: *See—*
Karpacheva, Susanna Mikhailovna; Karkhachev, Jury Georgievich; Muratov, Valeryan Matveevich; and Raginsky, Leonid Solomonovich, 3,870,638.

Murayama, Hiroo, to Illinois Tool Works Inc. Screw grommet. 3,869,958, Cl. 85-80.000.

Murphy, John E. Variable linear graph. 3,870,225, Cl. 235-89.00R.

Murray, Nancy J.: *See—*
Hutchinson, Ronald R.; Emley, Grace S.; Hallin, Edward R.; and Murray, Nancy J., 3,870,794.

Muszumanski, Trude, to Vockenhuber, Karl; and Hauser, Raimund. Inverted telephoto-type lens. 3,870,401, Cl. 350-214.000.

Mutschler, Otto, to J. S. Staedtler. Tubular nib-type pen with a screwed-in nib. 3,870,421, Cl. 401-259.000.

Myakin, Valery Alexandrovich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.

Myers, Hubert A., to Hitco. Radome. 3,871,001, Cl. 343-872.000.

Myers, John L., to Sun Chemical Corporation. Solenoid servomechanism. 3,870,931, Cl. 317-146.000.

Myers-Sherman Company: *See—*
Shaddock, Roland E., 3,870,489.

N. L. Industries, Inc.: *See—*
Blumenthal, Warren B., 3,870,787.

N. V. Behaert S.A.: *See—*
Vandenbroucke, Gilbert, 3,870,854.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,722.
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,751.
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,752.

Nagai, Masayuki: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Nakajima, Robkuo: *See—*
Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Robkuo, 3,870,606.

Nakajo, Toshihiro, to Unic Corporation. Foldable crane. 3,870,162, Cl. 212-59.00R.

Nakamoto, Soichi; and Yanagisawa, Takeshi, to Canon Kabushiki Kaisha. Exposure meter. 3,870,418, Cl. 356-226.000.

Nakamoto, Soji, to Sanyo Electric Co., Ltd. Tape loading system for automatically withdrawing a tape from a cassette and engaging the tape with a recording and/or reproducing head. 3,871,025, Cl. 360-85.000.

Nakamura, Ichiro, to Hitachi, Ltd. Low-noise valve. 3,870,077, Cl. 137-614.110.

Nakamura, Toshio: *See—*
Kato, Nobuo; Nakamura, Toshio; and Terakado, Seishi, 3,870,983.

Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, to Snow Brand Milk Products Co., Ltd.; and Tokuyama Soda Kabushiki Kaisha. Process for the removal of mineral salts from milk. 3,870,613, Cl. 204-180.00P.

Nakayama, Hirokazu: *See—*
Inamoto, Yoshiaki; and Nakayama, Hirokazu, 3,870,759.

Nakayama, Sadao: *See—*
Kubota, Hayato; Nakayama, Sadao; and Tateishi, Teizaburo, 3,870,733.

Nalco Chemical Company: *See—*
Walker, Alfred O., 3,870,469.

Nanba, Yoku; Ono, Tetsuji; and Okuda, Yukio, to Nippon Shokubai Kagaku Kogyod Co., Ltd. Catalyst for the preparation of anthraquinone. 3,870,655, Cl. 252-435.000.

Nankivell, John E.: *See—*
Fajans, Jack; and Nankivell, John E., 3,869,922.

Nara, Hirotoshi; Watanabe, Wataru; Yokota, Tadashi; and Yanagi, Chiak, to Clairion Co., Ltd. Tape player. 3,870,248, Cl. 242-198.000.

Nash, Charles D.: *See—*
Carter, Ronald W.; and Nash, Charles D., 3,870,629.

Nasser, Benny E., Jr.: *See—*
Brown, Terry D.; Delap, Joseph A.; and Nasser, Benny E., Jr., 3,870,656.

National Gypsum Company: *See—*
Burkard, Edward A.; and Kossuth, Donald A., 3,870,538.
Gelsomino, Fred J., 3,870,546.

National Research Development Corporation: *See—*
Attenborough, Christopher George, 3,869,729.
Briggs, Philip Stanley, 3,870,464.
Brindley, Giles Skey, 3,870,051.
Mulvey, Thomas, 3,870,891.

National Semiconductor Corporation: *See—*
Mills, Thomas B., 3,870,964.

National-Standard Company: *See—*
Howard, Walter B., 3,870,453.

Naybour, Robert Douglas; Farrell, Trevor; and Roberts, William Elwyn, to Electricity Council, The. Making of connections in electrical power distribution systems. 3,870,848, Cl. 219-50.000.

Nead, Thomas Edward. Vector magnitude summing circuit. 3,870,871, Cl. 235-197.000.

Neary, Ralph E., to Schlage Lock Company. Screw guide. 3,869,890, Cl. 70-451.000.

Neary, Ralph E., to Schlage Lock Company. Lock indicator shield. 3,869,901, Cl. 70-432.000.

Nebbia, Rodolfo, to Robert Bosch Photokino GmbH. Mechanism for moving film into and from engagement with sprockets in motion picture projectors. 3,870,406, Cl. 352-159.000.

Nederbragt, Frits W., to Ross-Holm, division of Holm Tractor & Equipment Company. Automatic control for milking machine support structure. 3,870,021, Cl. 119-14.130.

Nelson, Gerald V.: *See—*
Ashton, William B.; Gonzalez, Luis A.; Nelson, Gerald V.; and Mead, Theodore C., 3,870,622.

Nelson, Hugh Wharton, to Combustion Engineering Inc. Monitoring chemical recovery furnace. 3,870,467, Cl. 23-230.00R.

Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich. Installation for the production of granulated products. 3,869,976, Cl. 99-484.000.

Nessel, Jiri: *See—*
London, Arnold B.; and Nessel, Jiri, 3,869,749.

Neti, Radhakrishna M., to Beckman Instruments, Inc. Nitrogen dioxide analysis. 3,870,468, Cl. 23-232.00R.

Neubold, Kurt: *See—*
Ibing, Gunther; and Neubold, Kurt, 3,870,743.

Neuer, Harald; Szenger, Franz; Herzog, Klaus; and Neumann, Joachim, to Zeiss-Stiftung, Carl. Universal multi-coordinate sensor. 3,869,799, Cl. 33-174.00L.

Neumann, Joachim: *See—*
Neuer, Harald; Szenger, Franz; Herzog, Klaus; and Neumann, Joachim, 3,869,799.

Nevin, Charles S.: *See—*
Kryger, Allen C.; Nevin, Charles S.; and Wilhelm, Donald L., 3,870,527.

New England Envelope Manufacturing Co.: *See—*
Howatt, George F., 3,869,965.

Newell, Stephen D., to Alco Standard Corporation. Portable pedestal mounted tower irrigator. 3,870,235, Cl. 239-177.000.

Nezat, Jerry W. Back pressure regulator for automotive engines. 3,870,083, Cl. 138-45.000.

Nichols, Charles: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.

Nichols, Peter L., Jr., to United States of America, Army. Polyurethane propellant. 3,870,578, Cl. 149-19.400.

Nichols, William W. Pickup truck spare tire mount and cover. 3,870,360, Cl. 296-37.00A.

Nickell, Louis G., to Hawaiian Sugar Planters Association. Ripening of sugarcane by use of n-valeric acid. 3,870,503, Cl. 71-106.000.

Nicklaus, Karl, to Esec Sales S. A. Machine for wiring a semiconductor component. 3,869,782, Cl. 29-203.00B.

Nicolay, Heinz; and Gruner, Hans, to Graubremse GmbH. Overrunning brake for trailers. 3,870,128, Cl. 188-112.000.

Nielson, Robert L., to United States of America, Navy. Electronic countermeasures system. 3,870,995, Cl. 343-18.00E.

Nikolaev, Vyacheslav Pavlovich: *See—*
Moshnin, Evgeny Nikolaevich; Romashko, Nikolai Ivanovich; Nikolaev, Vyacheslav Pavlovich; and Odnodushny, Viktor Alexeevich, 3,869,776.

Nims, Vernon J. Cabinet door structure. 3,870,391, Cl. 312-297.000.

Nippon Electric Company, Limited: *See—*
Ohkubo, Toshio, 3,870,257.
Shutoh, Masamichi, 3,870,922.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu, 3,870,970.
Tatebe, Horoshi, 3,869,953.
Yamaguchi, Mitsuo, 3,869,955.

Nippon Kogaku K.K.: *See—*
Wakahara, Shigeo, 3,870,407.

Nippon Shokubai Kagaku Kogyod Co., Ltd.: *See—*
Nanba, Yoku; Ono, Tetsuji; and Okuda, Yukio, 3,870,655.

Nippon Soda Company Limited: *See—*
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.

Nippon Telegraph and Telephone Public Corporation: *See—*
Kondo, Mamoru; and Kobayashi, Morio, 3,871,003.

Nippon Zeon Co., Ltd.: *See—*
Ogura, Shunichiro, 3,870,533.

Nippondenso Co., Ltd.: *See—*
Toyama, Koichi; and Taniguchi, Koichi, 3,870,911.

Nishikawa, Seiichi: *See—*
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.

Nishioka, Matsuo: *See—*
Oka, Shunzo; and Nishioka, Matsuo, 3,870,986.

Niskin, Shale J. Method and apparatus for determining surface wind velocity. 3,869,913, Cl. 73-189.000.

Nitsche, Herbert; and Hufnagl, Johann, to Siemens Aktiengesellschaft. Improved semiconductor rectifier assembly having a pivotable control module. 3,870,930, Cl. 317-100.000.

NL Industries, Inc.: *See—*
Blumenthal, Warren B., 3,870,788.

Noble, Donald E.; and Sanderson, Robert H. Loading ramp for pick-up trucks and the like. 3,870,170, Cl. 214-85.000.

Noguchi, Yoshiaki: *See—*
Iino, Hideo; and Iizuka, Satoru, 3,870,306.

Nolan, Mary E.: *See—*
Dempsey, Russell M.; Nolan, Mary E.; La Conti, Anthony B.; and Torkildsen, Robert A., 3,870,616.

Noll, Klaus; Oertel, Gunter; and Schafer, Karl, to Bayer Aktiengesellschaft. Textile finishing compounds. 3,870,556, Cl. 117-141.000.

Nomiya, Kosei: *See—*
Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, 3,870,897.

Nomura, Katsuhiko; Kurei, Hiroshi; and Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure correction indicator. 3,871,011, Cl. 354-152.000.

Nordeen, Erwin E.: *See—*
Friesen, Dale M.; and Nordeen, Erwin E., 3,870,491.

Nordson Corporation: *See—*
Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., 3,870,375.
Sandorf, Robert E., 3,870,946.
Wilhelm, Frederick R.; Hastings, Donald R.; and Lyth, William W., 3,870,233.

Noren, John Paul: *See—*
Pulk, Elgas, deceased; and Noren, John Paul, 3,870,114.

Norfin, Inc.: *See—*
Davis, Ernest D., 3,869,981.

Norgard, Fred C. Surface texture for fibrous boards. 3,870,540, Cl. 117-16.000.

Norman, Harry H., to Baliski, Stephen, a part interest. Apparatus for bending wire into a sinuous shape. 3,869,900, Cl. 72-384.000.

North Pacific Canners & Packers, Inc.: *See—*
Filz, William F., 3,870,813.

Northern Electric Company Limited: *See—*
Iyengar, Rama; Zuber, Bretislav Paul; and Boucher, Jean Raymond, 3,869,902.

Northrop Corporation: *See—*
Almich, Clarence L.; Polk, Jack D., Jr.; and Aulick, Robert A., 3,870,839.
Merrell, Franklin O., 3,870,587.

Northwest Molded Products Corp.: *See—*
Haley, Chester J., 3,870,192.

Norwood, David W., to Concorde Fibers Inc. Apparatus and method for treating yarn. 3,870,241, Cl. 242-18.00A.

Notte, Angelo J.: *See—*
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 3,870,445.

Oagley, Jack R., to Xerox Corporation. Electrostatic printing machine with self-cleaning coronal generating device. 3,870,883, Cl. 250-324.000.

Oaze-Futsuk-aichi: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Obayashi, Mikihiko: *See—*
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,870,694.

O'Brien, John A. Wheelbarrow like vehicle for transporting bulky material such as leaves, trash or the like. 3,870,367, Cl. 298-1.00B.

Oce-van der Grinten N.V.: *See—*
Kratcoski, Francis L.; and Willemse, Adrianus H., 3,870,017.

Oda, Takeshi: *See—*
Murakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,870,698.

Odnodushny, Viktor Alexeevich: *See—*
Moshnin, Evgeny Nikolaevich; Romashko, Nikolai Ivanovich; Nikolaev, Vyacheslav Pavlovich; and Odnodushny, Viktor Alexeevich, 3,869,776.

Oei, Han Yong: *See—*
Meyer, Norbert; Oei, Han Yong; Rausch, Werner; and Schneider, Horst, 3,869,894.

Oertel, Gunter: *See—*
Noll, Klaus; Oertel, Gunter; and Schafer, Karl, 3,870,556.

Oesterhelt, Gerhard; Winkler, Josef; Falkenberg, Dieter; and de Bucs, Eugen Szabo, to Siemens Aktiengesellschaft. Heat generator. 3,870,568, Cl. 136-212.000.

Oetiker, Hans. Connecting device between a pipe stub and a flexible hose surrounding the stub. 3,870,349, Cl. 285-249.000.

Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, to Tokyo-Shibaura Eelctric Co., Ltd. Semiconductor rectifier apparatus. 3,870,944, Cl. 321-8.00R.

Ogawa, Kinya: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,870,702.

Ogino, Hatsuo: *See—*
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.

Ogura, Masaaki: *See—*
Sato, Yostbumi; and Ogura, Masaaki, 3,870,138.

Ogura, Shunichiro, to Nippon Zeon Co., Ltd. Hydraulic composition. 3,870,533, Cl. 106-90.000.

Ohashi, Koichi: *See—*
Kusayama, Seiji; Ohashi, Koichi; and Takada, Shinzo, 3,870,675.

Ohi, Reiichi: *See—*
Shimamura, Isao; Shishido, Tadao; Ohi, Reiichi; and Iwano, Haruhiko, 3,870,520.

Ohkubo, Toshio, to Nippon Electric Company, Limited. Electrostatic recording using discharge space potential. 3,870,257, Cl. 346-74.0ES.

Ohlstein, Herbert; and Gruber, Alan H., to International Telephone and Telegraph Corporation. MIC carrier grounding arrangement. 3,870,974, Cl. 333-12.000.

Ohnmacht, Helmut, to Eichenauer, Fritz. Electrical heating element for bread toaster or the like. 3,870,863, Cl. 219-532.000.

Ohshima, Norio: *See—*
Yoshida, Fumitake; and Ohshima, Norio, 3,870,470.

Ojima, Yukio. Depth gauge for diver. 3,869,916, Cl. 73-300.000.

Oka, Shunzo; and Nishioka, Matsuo, to Matsushita Electric Industrial Co. Ltd. Device for simultaneously controlling a plurality of variable resistors. 3,870,986, Cl. 338-128.000.

Okabe, Yoshio: *See—*
Ikenga, Junichi; Matsuoka, Shigeru; and Okabe, Yoshio, 3,870,941.

Okajima, Yoshiaki: *See—*
Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, 3,870,603.

Okamoto, Shin: *See—*
Asadea, Takashi; and Okamoto, Shin, 3,870,596.

Okle, Kurt, to Stoba AG. Combined product hanger and label support. 3,870,267, Cl. 248-339.000.

Okuda, Yukio: *See—*
Nanba, Yoku; Ono, Tetsuji; and Okuda, Yukio, 3,870,655.

Okudaira, Sadao: *See—*
Takahashi, Yasuo; and Okudaira, Sadao, 3,870,402.

Okumoto, Takeomi; Ueda, Hiroshi; Sakai, Junji; and Shimada, Yogo, to Hitachi, Ltd. Method of producing casting moulds for precision casting. 3,870,529, Cl. 106-38.300.

Okuno, Zenjiro: *See—*
Machida, Hazime; and Okuno, Zenjiro, 3,870,644.

Olin Corporation: *See—*
Kraus, Theodore C., 3,870,758.
Saeman, Walter C., 3,870,784.
Tepas, Joseph J., Jr.; and Sangster, Arlon G., 3,870,471.

Olson, Fred A.: *See—*
Reinhardt, Paige J.; and Olson, Fred A., 3,870,853.

Oltman, Billie G.; Eckerman, Keith F.; Romberg, Gerald P.; and Prepejchal, William, to United States of America, Atomic Energy Commission. Temperature measurement device. 3,869,918, Cl. 73-339.00R.

Olympia Werke AG: *See—*
Rittberg, Eilt-Heyo, 3,871,004.
Olympus Optical Company Limited: *See—*
Yamashita, Nobuo; and Fujii, Toru, 3,870,400.
Omni Spectra, Inc.: *See—*
Dreyer, Charles W., 3,870,978.
Onda, Yoshiro: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,870,702.
O'Neill, Edward M., to Brown Jug, Inc. Modular wine bottle rack. 3,870,156, Cl. 211-74.000.
O'Neill, Gerald Joseph: *See—*
Holdsworth, Robert S.; O'Neill, Gerald Joseph; and Simons, Charles William, 3,870,797.
Onishi, Akira; Yukuta, Toshio; Iseda, Yutaka; and Iwami, Kouichi, to Bridgestone Tire Company Limited. Photopolymerization process for the manufacture of copolymer of butadiene and acrylonitrile. 3,870,620, Cl. 204-159.230.
Ono, Tetsuji: *See—*
Nanba, Yoku; Ono, Tetsuji; and Okuda, Yukio, 3,870,655.
Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Production of mixtures of carboxylic acids from mixtures of olefins. 3,870,734, Cl. 260-413.000.
Ontario Research Foundation: *See—*
Brown, Earle C.; Byers, Errol J.; and Kayani, Ghulam A., 3,870,951.
Oppedal, Tor: *See—*
Bergum, Bernard C.; and Oppedal, Tor, 3,870,566.
Ordway, Donald E.: *See—*
Hale, Richard W.; Tan, Patrick; Stowell, Richard C.; and Ordway, Donald E., 3,869,909.
Ore-Ida Foods, Inc.: *See—*
Green, Glen R.; and Bennion, Jay B., 3,870,809.
Orman, Richard John: *See—*
Castro, Roger Albert; Orman, Richard John; and Ryan, James Ernest, 3,870,775.
Orofino, Caesar F.: *See—*
Waugh, Theodore R.; Smith, Richard C.; Anzel, Sanford H.; and Orofino, Caesar F., 3,869,731.
Orth, Gunther, to Wolf-Gerate GmbH. Container for storage and preparation of a plant protective material containing at least two components. 3,870,147, Cl. 206-222.000.
Orthman, Henry, to Orthman Manufacturing, Inc. Seedbed splitter and shaper. 3,870,108, Cl. 172-722.000.
Orthman, Henry K., to Orthman Manufacturing, Inc. Tool bar lift assist wheel. 3,870,107, Cl. 172-413.000.
Orthman Manufacturing, Inc.: *See—*
Orthman, Henry, 3,870,108.
Orthman, Henry K., 3,870,107.
Osako, Naoto: *See—*
Kamo, Seiichi; Yanai, Noriyoshi; and Osako, Naoto, 3,870,755.
Osborne, George H., to R. E. Miller Pty. Limited. Base mounting for instruments and machines to be tilted. 3,870,265, Cl. 248-183.000.
Oshima, Shozo: *See—*
Tanaka, Kyugo; Oshima, Shozo; and Watanabe, Itaru, 3,870,760.
Ota, Isao; and Otsuka, Tetsuro, to Matsushita Electric Industrial Co., Ltd. Color image reproduction sheet employed in photoelectrophoretic imaging. 3,870,517, Cl. 96-1.500.
Otsuka, Tetsuro: *See—*
Ota, Isao; and Otsuka, Tetsuro, 3,870,517.
Ott, Helmut: *See—*
Ruchser, Erich; and Ott, Helmut, 3,870,073.
Otto Durr, Anlagen fur Oberflachentechnik, Firma: *See—*
Schneider, Ing. Udo U., Dr., 3,870,016.
Outboard Marine Corporation: *See—*
Larsen, Robert T., 3,869,848.
Larsen, Robert T., 3,870,117.
Payne, Guy D., 3,870,379.
Shimanckas, William J.; and Beem, W. Wayne, 3,870,258.
Ouvrier, Gunther, to Telefonaktiebolaget L M Ericsson. Emergency switching equipment for broadband transmission. 3,870,955, Cl. 325-2.000.
Ovchinnikov, Gennady Elizarovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Overkott, Franz Josef, to Peddinghaus, Carl Ullrich, Dr. Gland assembly. 3,870,381, Cl. 308-3.500.
Owatonna Tool Company: *See—*
Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,869,978.
Owens-Corning Fiberglas Corporation: *See—*
Workman, Gerald B.; and Deardurff, Lawrence R., 3,870,547.
Owens-Illinois Inc.: *See—*
Fuchs, Thomas D.; and Micka, John J., 3,870,184.
Oxy Metal Finishing Corporation: *See—*
Meyer, Norbert; Oei, Han Yong; Rausch, Werner; and Schneider, Horst, 3,869,894.
Smith, Colin, 3,870,573.
P.X. Industries, Inc.: *See—*
MacDonald, Paul M., 3,870,266.
Packaging Corporation of America: *See—*
Zeitter, Charles R., 3,870,221.
Packautomatic GmbH & Co. K.G., Firma: *See—*
Timmerbeil, Karl-Ernst, 3,869,846.
Pagdin, Brian Colin: *See—*
Webb, Oswald; and Pagdin, Brian Colin, 3,869,940.
Palmer, Bertram Joseph: *See—*
Davies, John Hazlewood; Palmer, Bertram Joseph; and Fisher, Leslie George, 3,869,878.
Palmer, Nigel Innes; and Sugarman, Nathan, to W. R. Grace & Co. Battery separator manufacturing process. 3,870,567, Cl. 136-148.000.
Palspros, Inc.: *See—*
Georgi, Walter L., 3,870,182.
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich. Method and apparatus for extending life period of furnace roofs. 3,869,996, Cl. 110-99.00R.
Pangburn, William Walrath, to General Electric Company. Mounting means for standardized dynamoelectric machines. 3,870,909, Cl. 310-91.000.
Pao Chen, Paul Chuan. Piling system. 3,869,869, Cl. 61-53.640.
Paper, Calmenson & Co.: *See—*
Reinhardt, Paige J.; and Olson, Fred A., 3,870,853.
Paper Converting Machine Company: *See—*
Bradley, John J., 3,870,292.
Paradyne Corporation: *See—*
Saliga, Thomas V., 3,870,828.
Parker, Robert W.: *See—*
Percival, Eric R.; and Parker, Robert W., 3,870,075.
Pascale, John V.: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,870,800.
Pasedach, Heinrich; and Friederang, Albrecht, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of piperitenone. 3,870,761, Cl. 260-586.00C.
Paterson, Stephen, to Cutting Room Appliances Corp. Phase shifting device for cloth laying carriage. 3,870,290, Cl. 270-30.000.
Patrick, Malcolm W.; and Adams, Joseph W., to Bettcher Manufacturing Corporation. Oil-fired radiant space heater. 3,870,052, Cl. 126-91.00R.
Patterson International Corporation: *See—*
Patterson, Lawrence T., Jr., 3,870,303.
Patterson, Lawrence T., Jr., to Patterson International Corporation. Soccer table with goal and penalty opening. 3,870,303, Cl. 273-85.00D.
Patton, Stuart: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,870,800.
Patton, Tad L., to Exxon Research and Engineering Company. Selective hydroperoxidation of polyolefins in an aqueous slurry. 3,870,692, Cl. 260-93.700.
Patzke, Robert C.; and Goebel, Joseph, to Addressograph-Multigraph Corporation. Brake assembly. 3,870,981, Cl. 335-296.000.
Paul Forkardt Kommanditgesellschaft: *See—*
Beckers, Heinz, 3,870,323.
Paul, Harald: *See—*
Bausch, Gunther; Millauer, Christian; and Paul, Harald, 3,870,285.
Paulson, Elmir Edward, to General Electric Company. Gear arrangement for variable pitch fan. 3,870,434, Cl. 416-160.000.
Paviak, Stanley C., to Gulf Research & Development Company. Method of cleaning hair. 3,870,660, Cl. 252-545.000.
Paxton, Ruby: *See—*
Chase, Bert, 3,869,972.
Payne, Guy D., to Outboard Marine Corporation. Endless traction assembly. 3,870,379, Cl. 305-35.0EB.
Pearlstein, Fred; and Weightman, Robert F., to United States of America, Army. Electroless deposition of copper and copper-tin alloys. 3,870,526, Cl. 106-1.000.
Pechiney Ugine Kuhlmann: *See—*
Grimaud, Edouard; and Tournut, Claude, 3,870,691.
Grimaud, Edouard; and Troussier, Maurice, 3,870,767.
Pechmann, Karl: *See—*
Mackey, E. Scudder; Pechmann, Karl; and Tritten, Donald E., 3,870,521.
Peddinghaus, Carl Ullrich, Dr.: *See—*
Overkott, Franz Josef, 3,870,381.
Pedersen, Niels P.; and Shabel, John M., to General Electric Company. Inverter system having smooth switching between operational modes. 3,870,945, Cl. 321-9.00A.
Peitz, Josef, Jr. Composite stone arrangement for pavements. 3,870,423, Cl. 404-41.000.
Pennington, Robert E.: *See—*
Arnold, George T.; Hochman, Jack M.; and Pennington, Robert E., 3,870,621.
Pennsylvania Research Associates Inc.: *See—*
Jones, Alan P., 3,870,868.
Penrod, William R., to Beloit Corporation. Cooled deckle for die structure. 3,870,454, Cl. 425-466.000.
Peoples, Dennis Robert; and Maack, David Ralph, to Times Wire and Cable Companay. Radiating coaxial cable. 3,870,977, Cl. 333-84.00R.
Pera, Jaime Ernesto: *See—*
Rypinski, Chandos Arthur; and Pera, Jaime Ernesto, 3,870,958.

Percival, Eric R.; and Parker, Robert W., to Reed International Limited. Mixer taps. 3,870,075, Cl. 137-606.000.
Perkinson, Leon R.: *See—*
Moore, Francis C.; and Perkinson, Leon R., 3,870,639.
Perl, Richard L., to Tappan Company, The. Blue flame gas smooth top range. 3,870,457, Cl. 431-66.000.
Permutit Company, Inc., The: *See—*
Beach, William A.; and Schlauch, Richard M., 3,869,903.
Perri, Joseph, to Aetna Business Credit, Inc. Self-inverting hot top casing. 3,870,273, Cl. 249-202.000.
Perry, Robert J., to Phillips Petroleum Company. Method for creating inert gas barrier for product feed conduit. 3,869,807, Cl. 34-33.000.
Pesaro, Mario: *See—*
Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,870,659.
Pet Incorporated: *See—*
Driscoll, Robert R., 3,869,971.
Peters, Walter B.: *See—*
Afflerbach, Frank D.; Barnett, Irvin; and Peters, Walter B., 3,870,581.
Peterson, John A.: *See—*
Minklei, Alfred O.; and Peterson, John A., 3,870,554.
Peterson Machine Tool, Inc.: *See—*
Vaughan, Merle E., 3,869,803.
Peterson, William R.; and Johnson, Walter N., to GAF Corporation. Graft copolymer of ethylenically unsaturated carboxylic acids onto a substrate of poly-n-vinyl lactams. 3,870,770, Cl. 260-879.000.
Petzetakis, Nicholas George, to Unifoam AG. Production of polymeric foam. 3,870,441, Cl. 425-4.00C.
Peyrard, Yves; and Renault, Jean-Claude, to Thomson-CSF. Magnetron with an improved tuning mechanism. 3,870,923, Cl. 315-39.550.
Pezzino, Carmine. Hair roller. 3,870,057, Cl. 132-39.000.
Pfizer Inc.: *See—*
Abu El-Haj, Marwan J., 3,870,718.
Hamanaka, Ernest S., 3,870,709.
Hamanaka, Ernest S., 3,870,713.
Philip Morris Incorporated: *See—*
Kraft, Gerald A., 3,870,070.
Phillips, David P., to Wildwood Products, Inc. Stabilizing jack. 3,870,276, Cl. 254-86.00R.
Phillips Petroleum Company: *See—*
Brown, Terry D.; Delap, Joseph A.; and Nasser, Benny E., Jr., 3,870,656.
Campbell, Robert W., 3,870,686.
Campbell, Robert W., 3,870,687.
Gichowski, Robert S.; and Farha, Floyd E., Jr., 3,870,764.
Heckelsberg, Louis F.; and Banks, Robert L., 3,870,763.
Henderson, Eulas W., 3,870,785.
Johnson, Lewis T., 3,870,151.
Perry, Robert J., 3,869,807.
Pitzer, Emory W., 3,870,657.
Seefluth, Charles L., 3,870,446.
Picard, Roger: *See—*
Burdick, Steve; and Picard, Roger, 3,870,333.
Pickstone, William Frank, to Redman Fisher Engineering Limited. Conveyor. 3,869,989, Cl. 104-94.000.
Piekarski, Gottfried, to Wacker-Chemie GmbH. Process and catalyst for increasing the molecular weight of low-pressure polyethylene. 3,870,654, Cl. 252-429.00B.
Pierce, Philip F. Belt tensioning tool. 3,869,934, Cl. 74-242.120.
Pierson, Henri Gerhard Willem. Horizontal belt filters. 3,870,641, Cl. 210-400.000.
Pilkington Brothers Limited: *See—*
Crook, Peter John; and Riley, Stephen Philip, 3,870,661.
Piller, Bernhard, to Ciba-Geigy AG. S-triazine derivatives as ultraviolet protecting agents. 3,870,519, Cl. 96-51.000.
Pilot Man-Nev-Hitsu Kabushiki Kaisha: *See—*
Watanabe, Akio; and Murata, Yasuzo, 3,870,435.
Pinckney Molded Plastics, Inc.: *See—*
Sanders, Ellsworth E.; and Kreeger, Elsmer W., 3,870,185.
Pines, Seemon H.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,870,753.
Pingon, Pierre Joseph. Telescopic boom and carriage with shiftable wheels therefor. 3,870,163, Cl. 212-73.000.
Pioneer Electronic Corporation: *See—*
Kinoshita, Showzo, 3,870,833.
Pipkins, David D., to Valspar Corporation The. Carbonated organic solvent. 3,870,651, Cl. 252-364.000.
Pirner, Hans G., to Gillette Company, The. Gauging apparatus. 3,869,802, Cl. 33-174.00L.
Pitney-Bowes, Inc.: *See—*
Hubbard, David W., 3,869,986.
Uthenwoldt, Frederick W., 3,869,885.
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., to International Flavors & Fragrances, Inc. Foodstuff flavored with 4-(methylthio)butane derivatives. 3,870,800, Cl. 426-65.000.
Pitzer, Emory W., to Phillips Petroleum Company. Alumina-supported catalysts having substantial area in large pores. 3,870,657, Cl. 252-464.000.
Plaister, John Edward; and Cole, Leonard Edward, to Taylor & Challen Limited. Coining press. 3,869,893, Cl. 72-39.000.
Plasse, Paul A.: *See—*
Brackett, Robert D.; and Plasse, Paul A., 3,870,582.
Plasser, Franz, deceased (A-1010, by said Erna Plasser, heir); Theurer, Josef; and Schubert, Egon. Track surveying apparatus. 3,869,907, Cl. 73-146.000.
Plempel, Manfred: *See—*
Jager, Gerhard; Plempel, Manfred; and Buchel, Karl Heinz, 3,870,726.
Ploeckl, Johann, to Zellweger AG. Optical scanner mechanism. 3,870,394, Cl. 350-7.000.
Ploger, Walter: *See—*
Wollmann, Klaus; Ploger, Walter; and Wopms, Karl-Heinz, 3,870,750.
Plum, Hans; and Runggas, Friedrich, to Schering AG. Method for making organotin thioglycollic acid esters. 3,870,736, Cl. 260-429.700.
Plundo, Robert A.; Readal, Thomas C.; and Strom, James R., to Gulf Research & Development Company. Method for reducing the mercaptan content of a middle distillate oil. 3,870,626, Cl. 208-216.000.
Polaroid Corporation: *See—*
Brackett, Robert D.; and Plasse, Paul A., 3,870,582.
Burke, Edward F.; and Holmes, Douglas B., 3,871,013.
Whall, James M., 3,871,010.
Polazzi, Joseph Odo: *See—*
Kotick, Michael Paul; and Polazzi, Joseph Odo, 3,870,700.
Politechnika Gdanska Instytut Chemii i Technologii Organicznej Oraz Zywnosciowej: *See—*
Gruszecki, Wojciech; Taszer, Emil; and Borowski, Edward, 3,870,708.
Polk, Isaac H., to Kuhn, Harold C., a part interest. Foil dispenser. 3,870,212, Cl. 225-42.000.
Polk, Jack D., Jr.: *See—*
Almich, Clarence L.; Polk, Jack D., Jr.; and Aulick, Robert A., 3,870,839.
Pollmann, Fritz, to Siemens Aktiengesellschaft. Electrical contact carrier for electrical circuit breakers. 3,870,980, Cl. 335-202.000.
Poly-Version, Inc.: *See—*
Hummel, John, 3,870,150.
Polysius AG: *See—*
Korting, Reinhard; and Kluger, Alois, 3,870,100.
Polyurcon Limited: *See—*
MacMillan, Donald Stuart; and Churchward, Leonard, 3,869,744.
Pont-A-Mousson S. A.: *See—*
Vigneron, Pierre, 3,870,064.
Post Office, The: *See—*
Matthews, Oliver Charles, 3,870,822.
Potter Instrument Company, Inc.: *See—*
Gabor, Andrew, 3,870,870.
Potts, Bobby K.: *See—*
Lomax, Harold R.; and Potts, Bobby K., 3,870,429.
Pourrias, Bernard M.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,870,728.
Powell, Richard G.; and Smith, Cecil R., Jr., to United States of America, Agriculture. Production of harringtonine and isoharringtonine. 3,870,727, Cl. 260-326.500.
Powers, Donald; and Washechek, Delmar. Bird decoy. 3,869,823, Cl. 43-3.000.
Poynter, Donald B. Remotely actuated sound reproducing device. 3,870,318, Cl. 274-9.00R.
Prahl, Herman. Tumbler mechanism for cylinder lock. 3,869,889, Cl. 70-419.000.
Prahl, Herman. Drop bolt snap latch locking mechanism. 3,870,354, Cl. 292-116.000.
Pratt, George W., Jr., to Massachusetts Institute of Technology. High-frequency phonon generating apparatus and method. 3,871,017, Cl. 357-26.000.
Pray, Lester W.; and Anderson, Gordon C., to Saco-Lowell Corporation. Apparatus for and method of feeding bobbin tubes. 3,870,195, Cl. 221-225.000.
Precision Mechanisms Corporation: *See—*
Canick, Leon N.; and Aldrich, Charles S., 3,870,224.
Prepejchal, William: *See—*
Oltman, Billie G.; Eckerman, Keith F.; Romberg, Gerald P.; and Prepejchal, William, 3,869,918.
Presser, Karl-Heinz; and von der Decken, Claus-Benedict, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of determining the temperature of a high-temperature installation and a temperature-indicating body. 3,869,919, Cl. 73-358.000.
Presto Lock Company: *See—*
Feinberg, Irvin, 3,870,206.
Price, George M., to Frymaster Corporation, The. Control system for frying apparatus. 3,870,859, Cl. 219-437.000.
Privalov, Mikhail Moiseevich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Pro-Tech Inc.: *See—*
Irwin, Malcolm F., 3,869,921.
Production, Inc.: *See—*
Schmidt, Gunter, 3,870,889.
Prost, Roger: *See—*
Gardent, Maurice; Michalak, Wadislaw; and Prost, Roger, 3,869,876.

Pulk, Elgas, deceased (by Hallsenius, Carlgustaf, administrator); and Noren, John Paul, to Stabilator AB. Drilling apparatus especially for ground drilling. 3,870,114, Cl. 175-258.000.
Pureco Systems, Inc.: *See—*
Kearns, Tommy Carter; and Stoltenberg, Donald A., 3,870,585.
Puschel, Siegfried: *See—*
Abels, Theodor; and Puschel, Siegfried, 3,870,935.
Puyplat, Olivier, to Cibie Projecteurs. Motor vehicle headlamp. 3,870,876, Cl. 240-41.00R.
Pye, David S.: *See—*
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 3,870,668.
Pye Limited: *See—*
Hutchings, Bernard David Francis, 3,870,160.
Quehen, Andre, to SECIM. Roll changing device for a mill or a similar machine. 3,869,898, Cl. 72-239.000.
Quillevere, Herve Alain: *See—*
Lacroix, Armand Jean-Baptiste; Quillevere, Herve Alain; Cantaloube, Bernard Andre; and Caruel, Jacques Emile Jules, 3,869,865.
Quitman, Myron A. Grill for making sealed toasted sandwiches. 3,869,973, Cl. 99-426.000.
R. E. Miller Pty. Limited: *See—*
Osborne, George H., 3,870,265.
Raab, Stephan: *See—*
Kreuz, Otto; and Raab, Stephan, 3,870,097.
Rabasse, Jean, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Digital logic frequency control loop for multivibrator composed of two monostable elements. 3,870,969, Cl. 331-1.00A.
Rack-More Shelf Co.: *See—*
Hayward, Donald M., 3,870,157.
Racki, Jerome G.; and Thiel, Frank L., to Corning Glass Works. Optical coupler. 3,870,396, Cl. 350-96.0WG.
Radler, Richard W.: *See—*
Smith, Michael; Hackett, Charles F.; and Radler, Richard W., 3,870,516.
Ragazzini, Mario: *See—*
Modena, Mario; Ragazzini, Mario; Borsini, Giancarlo; and Valera, Marco, 3,870,689.
Raginsky, Leonid Solomonovich: *See—*
Karpacheva, Susanna Mikhailovna; Karkhachev, Jury Georgievich; Muratov, Valeryan Matveevich; and Raginsky, Leonid Solomonovich, 3,870,638.
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; and Samoilovsky, Igor Vasilievich. Worm pump. 3,870,433, Cl. 415-72.000.
Raines, Kenneth: *See—*
Burke, George K.; and Raines, Kenneth, 3,870,044.
Rajaratnam, Krishna: *See—*
Huey, Richard Meredith; and Rajaratnam, Krishna, 3,870,925.
Ralston Purina Company: *See—*
Boyer, Robert A.; and Middendorf, John E., 3,870,808.
Ranco Incorporated: *See—*
Attridge, Russell G., Jr., 3,870,227.
Randall, David I.; and Wynn, Robert W., to GAF Corporation. 2-Chloroethyl-phosphonothioic esters and thioesters. 3,870,772, Cl. 260-961.000.
Randall, Lyman J.; and Seward, Thomas P., III, to Corning Glass Works. Pseudo-fiber optic devices. 3,870,399, Cl. 350-96.00B.
Rannev, Alexandr Vladimirovich; Reish, Arvid Karlovich; Svirsky, Viktor Alexandrovich; and Khodykin, Boris Danilovich. Excavator with a dragline equipment. 3,869,814, Cl. 37-116.000.
Rau, Robert J., to Aetna-Standard Engineering Company. Shear apparatus. 3,869,948, Cl. 83-286.000.
Rausch, Karl W., Jr.: *See—*
Farrissey, William J., Jr.; and Rausch, Karl W., Jr., 3,870,674.
Rausch, Werner: *See—*
Meyer, Norbert; Oei, Han Yong; Rausch, Werner; and Schneider, Horst, 3,869,894.
Rauterkus, Karl Josef; and Blazek, Jan, to Hoechst Aktiengesellschaft. Process for the preparation of polymer dispersions of a vinyl esterethylene-an acrylamide being free from emulsifiers. 3,870,673, Cl. 260-29.60A.
Ravenna, Franco: *See—*
Carissimi, Massimo; and Ravenna, Franco, 3,870,720.
Raymond, A.: *See—*
Raymond, Alain, 3,869,766.
Raymond, Alain, to Raymond, A. Plastic snap fastener. 3,869,766, Cl. 24-216.000.
Raynaud, Guy M.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Le Cloarec, Albert Y.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,870,728.
RCA Corporation: *See—*
Bingham, Joseph Peter, 3,871,019.
Dingwall, Andrew Gordon Francis, 3,870,966.
Hanson, Richard Eric; and Fineman, Howard Eisen, 3,870,954.
Rypinski, Chandos Arthur; and Pera, Jaime Ernesto, 3,870,958.
Stave, Fredrick Roland, 3,870,835.
Torrington, Leslie Albert, 3,870,320.
Wilber, James Albert, 3,871,020.
Readal, Thomas C.: *See—*
Plundo, Robert A.; Readal, Thomas C.; and Strom, James R., 3,870,626.
Recycle Pallets Inc.: *See—*
Spencer, Kenneth M., 3,869,783.
Red Cross Manufacturing Corporation, The: *See—*
Lautzenheiser, Robert D.; and Ullman, Howard M., Jr., 3,870,239.
Redling, Anthony E. Tethered pins bowling game apparatus. 3,870,302, Cl. 273-44.000.
Redman Fisher Engineering Limited: *See—*
Pickstone, William Frank, 3,869,989.
Reece, Thomas L., to Dover Corporation. Filter with vibration of screen. 3,870,640, Cl. 210-388.000.
Reed International Limited: *See—*
Percival, Eric R.; and Parker, Robert W., 3,870,075.
Regie Nationale Des Usines Renault: *See—*
Guenot, Rene, 3,870,430.
Vignaud, Jean-Pierre; and Leguy, Bernard, 3,869,946.
Reichhold-Albert Chemie Aktiengesellschaft: *See—*
Becker, Wilhelm, 3,870,666.
Hofel, Heinz-Bernard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,669.
Hofel, Heinz-Bernhard; Kiessling, Hans-Joachim; Lampert, Fred; and Kuhr, Johann, 3,870,670.
Reilly, Jerry. Magnetic target and disc surface projectile game apparatus. 3,870,308, Cl. 273-126.00A.
Reinhard, Willy, to Gebruder Seidel KG. Container construction for mascara and like substances. 3,870,186, Cl. 220-212.000.
Reinhardt, Hans: *See—*
Liljenzin, Jan-Olov; Reinhardt, Hans; and Rydberg, Helge Jan Arnold, 3,870,060.
Reinhardt, Paige J.; and Olson, Fred A., to Paper, Calmenson & Co. Traveling welding machine. 3,870,853, Cl. 219-125.000.
Reinhoudt, Jacobus Pieter, to U. S. Philips Corporation. Axial bearing. 3,870,382, Cl. 308-9.000.
Reish, Arvid Karlovich: *See—*
Rannev, Alexandr Vladimirovich; Reish, Arvid Karlovich; Svirsky, Viktor Alexandrovich; and Khodykin, Boris Danilovich, 3,869,814.
Reisman, Howard. Tubular carton. 3,870,219, Cl. 229-4.500.
Rellstab, Werner; and Steiner, Hans, to Mettler Instrumente AG. Method and apparatus for automatic titration. 3,870,466, Cl. 23-230.00R.
Remy, Dennis K., to Gorman-Rupp Company, The. Air release valve for self-priming pumps. 3,870,436, Cl. 417-299.000.
Renault, Jean-Claude: *See—*
Peyrard, Yves; and Renault, Jean-Claude, 3,870,923.
Rennecker, David B.: *See—*
Boyd, Wilton E.; and Rennecker, David B., 3,869,751.
Renz, Albrecht: *See—*
Adam, Fritz Gunter; and Renz, Albrecht, 3,869,786.
Republic Electronics Industries Corporation: *See—*
Biagi, Alvaro D.; and Luganski, Dimitri, 3,870,993.
Research Corporation: *See—*
Faulkner, Raymond Noel, 3,870,664.
Reserve Mining Company: *See—*
Tuomela, Robert M.; Schroeder, Gustave W.; and Mattila, Robert O., 3,870,111.
Resnik, Bernard S.: *See—*
Senk, Herman W.; and Resnik, Bernard S., 3,869,763.
Rexnord Inc.: *See—*
Dieringer, Andrew M., 3,869,805.
Reynolds, Lester A. Fishing rod holder. 3,870,259, Cl. 248-43.000.
Rheintechnik Weiland & Kaspar OHG: *See—*
Weiland, Werner, 3,870,049.
Rhone-Poulenc S.A.: *See—*
Bost, Pierre-Etienne; Costantini, Michel; and Lartigau, Guy, 3,870,729.
Bourat,,Guy, 3,870,617.
Richards, Kenneth Julian: *See—*
Wright, Craig Nellis; and Richards, Kenneth Julian, 3,870,779.
Richards Manufacturing Company: *See—*
Treace, Harry T., 3,869,795.
Richards, Peter Henry: *See—*
Jack, Harry Ross Scarlett; Richards, Peter Henry; and Skelding, Kenneth George, 3,870,500.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; and Claxton, George P., 3,870,723.
Richmond, Albert R.; and Appleman, William S., to Richmond Manufacturing Company, The. Power train for horizontal earth boring machine. 3,870,110, Cl. 173-163.000.
Richmond Manufacturing Company, The: *See—*
Richmond, Albert R.; and Appleman, William S., 3,870,110.
Richter, Harold L. Motor piston tube cleaner. 3,869,747, Cl. 15-104.10R.
Richter, Herbert. Tape slitting and metering device. 3,869,999, Cl. 112-121.260.
Ricoh Co. Ltd.: *See—*
Abe, Takeshi, 3,870,409.
Abe, Takeshi, 3,870,410.
Sato, Yostbumi; and Ogura, Masaaki, 3,870,138.
Ridgeway, Ralph H. Rocker arm stud support device. 3,870,024, Cl. 123-90.410.
Riedel, Klaus: *See—*
Kall, Horst; and Riedel, Klaus, 3,870,493.
Riedel, Oswald: *See—*
Koehler, Waldemar; Riedel, Oswald; Scherer, Hertbert; and Schlereth, Georg, 3,869,914.
Riedy, Charles H.: *See—*
Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., 3,870,375.
Riley, Stephen Philip: *See—*
Crook, Peter John; and Riley, Stephen Philip, 3,870,661.

Ringeman, Othmar E.: *See—*
Hill, Robert L.; and Ringeman, Othmar E., 3,870,393.
Riordan, Hugh E., to Kelsey-Hayes Company. Skid control system. 3,870,376, Cl. 303-21.00P.
Rittberg, Eilt-Heyo, to Olympia Werke AG. Ink drop writing head. 3,871,004, Cl. 346-75.000.
Ritzler, Bo, to AB Filtrator. Separating arrangement. 3,870,483, Cl. 55-192.000.
Rivetta, Gianfranco; and Marcotti, Egidio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Switch pushbutton-type digit keyboard switch with leaf spring contract and actuator biasing means on common conductive frame. 3,870,840, Cl. 200-5.00A.
Rizzi, Marc A.: *See—*
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 3,870,445.
Robert Bosch GmbH: *See—*
Fussner, Paul, 3,870,910.
Wurst, Bert, 3,870,119.
Robert Bosch Photokino GmbH: *See—*
Nebbia, Rodolfo, 3,870,406.
Robert, Michel, to Engins Matra. Method for controlling acceleration and deceleration of a traction motor. 3,870,939, Cl. 318-611.000.
Roberts, Gordon J., to Ferro Corporation. Catalytic amorphous glass fibers. 3,870,530, Cl. 106-50.000.
Roberts, Jeffrey A.: *See—*
Klingler, Richard E.; and Roberts, Jeffrey A., 3,870,005.
Roberts, Robert C; and Alcorn, Edward B., to Engineered Devices Company. Time-division multiplex communication system. 3,870,825, Cl. 179-15.0AL.
Roberts, William Elwyn: *See—*
Naybour, Robert Douglas; Farrell, Trevor; and Roberts, William Elwyn, 3,870,848.
Robertshaw Controls Company: *See—*
Hendrick, Fred W., 3,870,458.
Manecke, Siegfried E., 3,870,229.
Robinson, Christopher Thomas. Stowage of vehicles. 3,869,991, Cl. 105-368.00R.
Robinson, John W.: *See—*
Hayes, Lester P.; Robinson, John W.; Simms, Ross P.; and Russell, Millard E., 3,870,805.
Robinson, Michael; Wilson, Harry Brian; and Gray, David Antony, to Laporte Industries Limited. Beneficiation of ores. 3,870,506, Cl. 75-1.000.
Robinson, William I. Stand. 3,870,264, Cl. 248-171.000.
Rock Industries Machinery Corporation: *See—*
Tylinski, Raymond S., 3,870,630.
Rockwell International Corporation: *See—*
Hallford, Ben R.; and Wright, Charles H., 3,870,960.
Stoffer, Cornelis Daniel, 3,870,899.
Rodach, Alexander; and Weber, Hans, to Ungerer, Frau Irma. Upcoiler for coiling a plurality of strips. 3,869,845, Cl. 53-137.000.
Rogalski, Werner: *See—*
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,870,757.
Roger Boatman & Associates, Inc.: *See—*
Boatman, Roger M.; and Hall, Melvin R., 3,870,953.
Rogers, Lucious E. Knockdown furniture. 3,870,366, Cl. 297-440.000.
Rogozhin, Sergei Vasilievich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.
Rohlfing, Raymond A., to Gates Rubber Company, The. Method of preparing a bias fabric. 3,870,478, Cl. 29-2.100.
Rohm GmbH: *See—*
Fink, Herbert; Munzer, Manfred; and Dinklage, Horst, 3,870,557.
Rohm and Haas Company: *See—*
Clemens, David H.; and Hamann, Herman C., 3,870,663.
Hurwitz, Melvin D., 3,870,590.
Miller, George A.; and Weiler, Ernest D., 3,870,795.
Rohr, Wolfgang: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,870,740.
Rohrer, Wesley M., Jr.: *See—*
Apt, Jerome, Jr.; Wachter, William J.; and Rohrer, Wesley M., Jr., 3,870,078.
Roland Offsetmaschinenfabrik & Schleicher AG.: *See—*
Simeth, Claus, 3,870,293.
Rolls-Royce (1971) Limited: *See—*
Bartlett, Christopher Leslie; and Willis, Peter Charles, 3,869,800.
Romashko, Nikolai Ivanovich: *See—*
Moshnin, Evgeny Nikolaevich; Romashko, Nikolai Ivanovich; Nikolaev, Vyacheslav Pavlovich; and Odnodushny, Viktor Alexeevich, 3,869,776.
Romberg, Gerald P.: *See—*
Oltman, Billie G.; Eckerman, Keith F.; Romberg, Gerald P.; and Prepejchal, William, 3,869,918.
Ronalds, Hugh C. Teaching machine. 3,869,810, Cl. 35-9.00C.
Rongved, Leif: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,870,416.
Ross-Holm, division of Holm Tractor & Equipment Company: *See—*
Nederbragt, Frits W., 3,870,021.
Rossbach, Peter G.: *See—*
Hunnicutt, Wayne E.; and Rossbach, Peter G., 3,869,767.
Roth, John F.: *See—*
Lose, John G.; and Roth, John F., 3,869,927.
Rotographic Machinery Company, The: *See—*
Steinmetz, Floyd; and Thoms, William F., 3,869,985.
Rotter, Erhard F., to Arendt, Hans F. Continuous washing machine. 3,869,883, Cl. 68-58.000.
Roussel-Uclaf: *See—*
Martel, Jacques; Toromanoff, Edmond; and Buendia, Jean, 3,870,710.
Martel, Jacques; Buendia, Jean; and Toromanoff, Edmond, 3,870,711.
Rowe, Horace N. Pickup mount for stringed musical instruments. 3,869,952, Cl. 84-1.160.
Rowman, Philip J. Magnetically indexed rotating disks chance device. 3,870,313, Cl. 273-143.00C.
Rozner, Allan, to C. J. I. Industries, Inc. Integral jack strip for pattern wheel knitting machines. 3,869,880, Cl. 66-50.00A.
Ruben, Samuel. Hermetically sealed storage battery. 3,870,563, Cl. 136-26.000.
Rubin, Philip Edward: *See—*
Corwin, Walter Leo; Keeler, Robert Emerson; and Rubin, Philip Edward, 3,870,838.
Ruchser, Erich; and Ott, Helmut, to Technomatic A.G. Valve assembly for controlling fluid pressure operated apparatus particularly presses. 3,870,073, Cl. 137-596.160.
Rudkov, Gennady Demyanovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Semenovich; and Koroleva, Margarita Borisovna, 3,870,462.
Runggas, Friedrich: *See—*
Plum, Hans; and Runggas, Friedrich, 3,870,736.
Rusk, Gerald; and Koch, Robert E., to Freeman Supply Company, The. Guide bushing. 3,870,092, Cl. 151-14.00R.
Russell, Millard E.: *See—*
Hayes, Lester P.; Robinson, John W.; Simms, Ross P.; and Russell, Millard E., 3,870,805.
Rust, Kurt: *See—*
Gordon, Wolfgang; Rust, Kurt; and Schrott, Erwin, 3,870,690.
Rutman, Dmitry Samuilovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.
Ruygrok, Albertus Pieter, to GAF Corporation. Ink receiving matte sheet materials overcoated with an alkyl monoester of poly (alkyl vinyl ether-maleic acid). 3,870,549, Cl. 117-73.000.
RVL Industries, Inc.: *See—*
Large, Richard L., 3,870,362.
Ryan, James Ernest: *See—*
Castro, Roger Albert; Orman, Richard John; and Ryan, James Ernest, 3,870,775.
Rybalko, Alexei Petrovich; Karpekin, Viktor Vladimirovich; Didenko, Nikolai Sidorovich; and Volokhov, Ivan Ivanovich. Gas and heat protective garment. 3,869,871, Cl. 62-178.000.
Rydberg, Helge Jan Arnold: *See—*
Liljenzin, Jan-Olov; Reinhardt, Hans; and Rydberg, Helge Jan Arnold, 3,870,060.
Rygiol, Henry V. Multi-arc pipe welding. 3,870,849, Cl. 219-60.00A.
Rypinski, Chandos Arthur; and Pera, Jaime Ernesto, to RCA Corporation. Circuit for applying data signals across a microphone input circuit. 3,870,958, Cl. 325-155.000.
S. Madill Ltd.: *See—*
Burley, Murray E., 3,870,158.
Sachs, Hanns Immo: *See—*
Diehr, Hans-Joachim; Kraft, Karl-Josef; and Sachs, Hanns Immo, 3,870,665.
Saco-Lowell Corporation: *See—*
Pray, Lester W.; and Anderson, Gordon C., 3,870,195.
Savageau, Richard J.; and Anderson, Gordon C., 3,869,759.
Sadoski, Tadius T.: *See—*
Latassa, Frank M.; Milke, Howard W.; and Sadoski, Tadius T., 3,869,772.
Saeman, Walter C., to Olin Corporation. Sodium bicarbonate production. 3,870,784, Cl. 423-422.000.
Sage Action Inc.: *See—*
Hale, Richard W.; Tan, Patrick; Stowell, Richard C.; and Ordway, Donald E., 3,869,909.
Sage, George H. Back scrubber, massager and lotion applicator. 3,870,419, Cl. 401-8.000.
Sahagun-Barragan, Jaime. Dripping irrigation tubing. 3,870,236, Cl. 239-542.000.
Saito, Bunjiro: *See—*
Miyauchi, Rin-Ichi; Saito, Bunjiro; and Ikeda, Kyoichi, 3,869,920.
Sakai, Junji: *See—*
Okumoto, Takeomi; Ueda, Hiroshi; Sakai, Junji; and Shimada, Yogo, 3,870,529.
Sakamoto, Minoru. Combination solar and manual distiller and rain catcher. 3,870,605, Cl. 202-234.000.

Salem Corporation: *See—*
Wilt, Charles R., Jr., 3,870,604.
Saliga, Thomas V., to Paradyne Corporation. Superimposed binary signal. 3,870,828, Cl. 179-15.0BY.
Salzer, Erwin, to Chase-Shawmut Company, The. High-voltage fuse with plugs of sheet metal. 3,870,984, Cl. 337-161.000.
Samoilovsky, Igor Vasilievich: *See—*
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; and Samoilovsky, Igor Vasilievich, 3,870,433.
Sanders Associates, Inc.: *See—*
Mallet, Alfred L., 3,870,989.
Sanders, Ellsworth E.; and Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Collapsible container. 3,870,185, Cl. 220-6.000.
Sanderson, Robert H.: *See—*
Noble, Donald E.; and Sanderson, Robert H., 3,870,170.
Sandler, Joseph Jacob: *See—*
Wallick, Seymour Dudley; and Sandler, Joseph Jacob, 3,869,750.
Sandorf, Robert E., to Nordson Corporation. Quick connect modular voltage multiplier. 3,870,946, Cl. 321-15.000.
Sandoz-Wander, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,722.
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,751.
Houlihan, William J.; and Nadelson, Jeffrey, 3,870,752.
Sangster, Arlon G.: *See—*
Tepas, Joseph J., Jr.; and Sangster, Arlon G., 3,870,471.
Sanjo, Sadao: *See—*
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi, 3,870,637.
Sanrama Padro, Ramon: *See—*
Castany Ferre, Jose; and Sanrama Padro, Ramon, 3,870,000.
Sanyo Electric Co., Ltd.: *See—*
Nakamoto, Soji, 3,871,025.
Sarkisov, Rafael Tevosovich; Stepanian, Ernst Arakelovich; and Bondarenko, Valentin Grigorievich. Metal strip coil changing device. 3,870,244, Cl. 242-80.000.
Sarnoff, Stanley J., to Survival Technology, Inc. Method and apparatus for self-administering pre-hospital phase treatment of coronary prone individuals in the early minutes or hours after the onset of heart attack symptoms. 3,870,035, Cl. 128-2.05T.
Sarradin, Joel Alain: *See—*
Bonnemay, Maurice; Bronoel, Guy Rene; Donnet, Jean-Baptiste; Lahaye, Jacques; and Sarradin, Joel Alain, 3,870,565.
Sato, Akira: *See—*
Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, 3,870,524.
Sato, Masamichi; and Tezuka, Shigeru, to Xerox Corporation. Liquid development for the electronic photography. 3,870,514, Cl. 96-1.0LY.
Sato, Yostbumi; and Ogura, Masaaki, to Ricoh Co., Ltd. Motor control unit for table-type electronic calculator with printer. 3,870,138, Cl. 197-17.000.
Saunders, John Christopher: *See—*
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,870,721.
Saunders, Thomas Edward: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,870,416.
Savageau, Richard J.; and Anderson, Gordon C., to Saco-Lowell Corporation. Drive means for textile sliver drafting assembly. 3,869,759, Cl. 19-293.000.
Sawano, Takahiro: *See—*
Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, 3,870,944.
Sawyer, Willard C., to Gorham International Inc. Apparatus for mixing air and steam for delivery to a dryer. 3,869,808, Cl. 34-124.000.
Scaletta, Joseph Louis, to Xerox Corporation. Diagnostic test device for developer materials. 3,869,910, Cl. 73-150.00R.
Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper. 3,869,761, Cl. 24-73.0VA.
Schadlich, Gunther; and Moraw, Roland, to Hoechst Aktiengesellschaft. Apparatus for deforming a thermoplastic layer using a shaped cooling template. 3,871,002, Cl. 346-74.0TP.
Schaefer, Frank W. Apparatus for applying refractory covering to skid rail. 3,870,442, Cl. 425-117.000.
Schafer, Karl: *See—*
Noll, Klaus; Oertel, Gunter; and Schafer, Karl, 3,870,556.
Scharfe, Gerhard; and Grolig, Johann, to Bayer Aktiengesellschaft. Production of anthraquinone from naphthalene. 3,870,730, Cl. 260-369.000.
Schatz, Oskar, to Frid. Krupp Gesellschaft mit Beschrankter Hoftung. Hot-pressing system. 3,870,443, Cl. 425-28.00R.
Scheffel, Walter. Apparatus for withdrawing and storing filling yarn in stationary filling supply weaving machines. 3,870,088, Cl. 139-122.00R.
Scheller, Donald M.: *See—*
Leidy, William S.; and Scheller, Donald M., 3,870,253.
Scherer, Hertbert: *See—*
Koehler, Waldemar; Riedel, Oswald; Scherer, Hertbert; and Schlereth, Georg, 3,869,914.
Schering AG: *See—*
Plum, Hans; and Runggas, Friedrich, 3,870,736.
Schering Corporation: *See—*
Warren, Bert; and Evans, George L., 3,870,601.
Schettler, Kurt, to Kraftwerk Union Aktiengesellschaft. Straight-through filter apparatus. 3,870,636, Cl. 210-236.000.
Schicketanz, Dieter, to Siemens Aktiengesellschaft. Connecting plug for optical glass fibers. 3,870,395, Cl. 350-96.00C.
Schiffer, Gunther, to Fa. Kleinewefers Industrie-Companie GmbH. Suspension loop damper for heavy webs. 3,870,215, Cl. 226-42.000.
Schimke, Thomas O., to General Electric Company. Thermostat mounting. 3,870,858, Cl. 219-328.000.
Schindel, Arnold, to Singer Company, The. Hydraulic actuator having a self-aspirating actuator rod seal. 3,869,963, Cl. 92-86.000.
Schirmer, Henry G., to W. R. Grace & Co. Irradiated insoluble amylose starch. 3,870,609, Cl. 204-160.100.
Schlage Lock Company: *See—*
Neary, Ralph E., 3,869,890.
Neary, Ralph E., 3,869,901.
Schlauch, Richard M.: *See—*
Beach, William A.; and Schlauch, Richard M., 3,869,903.
Schlereth, Georg: *See—*
Koehler, Waldemar; Riedel, Oswald; Scherer, Hertbert; and Schlereth, Georg, 3,869,914.
Schlotterbeck, Heinz; and Staake, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cam shaft for reciprocable piston internal combustion engines. 3,869,938, Cl. 74-567.000.
Schmid, Jurg Friedrich, to Maschinenfabrik Wifag. Web tensioning device. 3,870,214, Cl. 226-34.000.
Schmidt, Gunter, to Production, Inc. Film sheet cassette. 3,870,889, Cl. 250-480.000.
Schmidt, Joe: *See—*
Schrader, William A.; and Schmidt, Joe, 3,870,249.
Schneider, Horst: *See—*
Meyer, Norbert; Oei, Han Yong; Rausch, Werner; and Schneider, Horst, 3,869,894.
Schneider, Ing. Udo U., Dr., to Otto Durr, Anlagen fur Oberflachentechnik, Firma. Box for powder coating. 3,870,016, Cl. 118-309.000.
Schneider, J. Raymond. Apparatus for heating and dispensing french fried potatoes. 3,870,193, Cl. 221-150.00A.
Schneider, Michael. Expansible plugs for sewer pipes. 3,870,085, Cl. 138-93.000.
Schneider, Ralph W. Air cushion vehicle. 3,870,121, Cl. 180-117.000.
Schneider, Walter: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.
Schneiderhan, Edward M.; Jones, John E.; and Briggs, Henry P., to Cummins-Allison Corp. Method and apparatus for optical reading of recorded data. 3,870,865, Cl. 235-61.11E.
Schock, Delmas A., to Mayfran Incorporated. Circuit for controlling a thyristor by direct current logic. 3,870,904, Cl. 307-252.00B.
Scholl, Hans, to Kochs Adler AG. Sewing device. 3,869,998, Cl. 112-121.150.
Scholz, Norbert: *See—*
Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, 3,869,988.
Schrader, William A.; and Schmidt, Joe, to Ex-Cell-O Corporation. Controlled friction tape roller. 3,870,249, Cl. 242-201.000.
Schreyer, Gerd: *See—*
Lussling, Theodor; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,870,746.
Schriever, Fred G. Multiple tape dispenser. 3,870,211, Cl. 225-34.000.
Schroeder, Gustave W.: *See—*
Tuomela, Robert M.; Schroeder, Gustave W.; and Mattila, Robert O., 3,870,111.
Schroeder, Marvin C., Jr., to Cordura Corporation. High speed data processor line printer. 3,869,980, Cl. 101-93.210.
Schrott, Erwin: *See—*
Gordon, Wolfgang; Rust, Kurt; and Schrott, Erwin, 3,870,690.
Schubert, Egon: *See—*
Plasser, Franz, deceased; Theurer, Josef; and Schubert, Egon, 3,869,907.
Schudel, Peter: *See—*
Bozzato, Giulinao; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,870,659.
Schulz, Johann G. D.: *See—*
Onopchenko, Anatoli; and Schulz, Johann G. D., 3,870,734.
Schulz, Max Erich, to Gervais-Danone AG. Processes for the production of protein-rich foodstuffs from natural protein-containing foods that are subject to syneresis. 3,870,811, Cl. 426-348.000.
Schulz, Waldemar, to Volkswagenwerk Aktiengesellschaft. Steering arrangement for motor vehicles. 3,870,335, Cl. 280-90.000.
Schurdak, Edward. Copper inhibitors for polyolefins. 3,870,680, Cl. 260-45.85B.
Schurle, Werner; and Muller, Anton, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Chain link for antiskid and tire protective chains. 3,870,094, Cl. 152-243.000.
Schussel, Edward W., to Wesco Industries, Corporation. Yarn retarding device. 3,870,242, Cl. 242-47.010.
Schwartz, Robert C.; and Burke, Frederick, to Motiva, Ltd. Collapsible slide projection theatre. 3,870,411, Cl. 353-73.000.
Schwitzgobel, Rudolf: *See—*
Monreal, Karl; and Schwitzgobel, Rudolf, 3,870,571.
Sci-Med Laboratories, Inc.: *See—*
Greenfield, Walter; and Berg, Raymond, 3,870,146.
Scott & Fetzer Company, The: *See—*
Horrocks, Raymond G., 3,869,791.
SECIM: *See—*
Quehen, Andre, 3,869,898.

Seefluth, Charles L., to Phillips Petroleum Company. Clamping jaws with offset tines for alignment and transfer of parisons. 3,870,446, Cl. 425-174.400.

Seewer AG, Maschinenfabrik: *See—*
Seewer, Ruedi, 3,869,975.

Seewer, Ruedi, to Seewer AG, Maschinenfabrik. Pastry cutter. 3,869,975, Cl. 99-450.200.

Self-Cleaning Environments: *See—*
Garvey, Glenwood L.; and Begley, Richard J., 3,869,732.

Seliber, Joseph. Low pollution and fuel consumption flywheel drive system for motor vehicles. 3,870,116, Cl. 180-54.00R.

Sellars, George L., to Dravo Corporation. Sand fracturing apparatus and method. 3,870,238, Cl. 241-27.000.

Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Semenovich; and Koroleva, Margarita Borisovna. Furnace for direct non-oxidizing heating of material under thermal treatment. 3,870,462, Cl. 432-72.000.

Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft: *See—*
Kogert, Herbert, 3,870,852.

Senda, Katsuyuki; and Kobashi, Mamoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition plug with auxiliary electrode. 3,870,918, Cl. 313-131.00R.

Seneca Chemicals, Inc.: *See—*
Travers, Hal, 3,870,647.

Senk, Herman W.; and Resnik, Bernard S., to Lehigh Industries, Inc. Buckle-strap construction. 3,869,763, Cl. 24-198.000.

Sequist Valve Company: *See—*
Bucaro, Russell J., 3,870,205.

Serra, Arthur Bienvenu Dalla, to Societe Herve & Fils, Papeteries du Sentier (Societe Anonyme). Apparatus for transverse cutting or perforating a continuously advancing web. 3,869,950, Cl. 83-341.000.

Setterstrom, William R. Self-contained tertiary filter plant and chlorination unit. 3,870,633, Cl. 210-136.000.

Seubert, Jurgen: *See—*
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,870,757.

Seventrees, Ltd.: *See—*
Theodore, Paris, 3,870,208.

Severov, Mark Alexandrovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Semenovich; and Koroleva, Margarita Borisovna, 3,870,462.

Seward, Thomas P., III: *See—*
Randall, Lyman J.; and Seward, Thomas P., III, 3,870,399.

Seyb, Edgar J., Jr.; and Woehrle, Richard E., to M & F Chemicals Inc. Chromium plating method. 3,870,618, Cl. 204-28.000.

Shabel, John M.: *See—*
Pedersen, Niels P.; and Shabel, John M., 3,870,945.

Shaddock, Roland E., to Myers-Sherman Company. Air filter systems for debris collecting apparatus. 3,870,489, Cl. 55-314.000.

Shade, Steven F.: *See—*
Brown, Michael A.; and Shade, Steven F., 3,869,743.

Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; and Kadi-Ogly, Ibragim Akhmedovich. Rotor winding directly cooled by liquid for use in non-salient pole synchronous machine. 3,870,913, Cl. 310-208.000.

Shapras, Peter: *See—*
Harris, Alva F.; and Shapras, Peter, 3,870,802.

Sharp, Douglas Cecil William Thomas, to Watermill Engineering Limited. Toasting apparatus. 3,869,969, Cl. 99-327.000.

Shatzkin, Leonard: *See—*
Heller, William C., Jr.; and Shatzkin, Leonard, 3,870,344.

Shell Oil Company: *See—*
Condon, Nancy J., 3,870,676.

Shepherd, Don W., to A. C. Weber & Co., Inc. Retraction mechanism and sewing machine cabinet. 3,870,386, Cl. 312-30.000.

Sherwood, Henry A. Dictating and playback apparatus. 3,870,319, Cl. 274-13.000.

Shibano, Takashi; Hirakawa, Koichi; and Yonehara, Toshimitsu, to Matsushita Electric Industrial Co., Ltd. Impregnated electromagnetic coil having a layer voltage applied thereto. 3,870,982, Cl. 335-297.000.

Shields, John P., to Allegheny Plastics, Inc. Radio frequency heater and control therefor. 3,870,847, Cl. 219-10.770.

Shimada, Yogo: *See—*
Okumoto, Takeomi; Ueda, Hiroshi; Sakai, Junji; and Shimada, Yogo, 3,870,529.

Shimadzu Seisakusho Ltd.: *See—*
Tanno, Naoichiro, 3,869,769.

Shimamoto, Takio: *See—*
Inoue, Michiro; Ishikawa, Masayuki; Tsuchiya, Takashi; and Shimamoto, Takio, 3,870,792.

Shimamura, Isao; Shishido, Tadao; Ohi, Reiichi; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Photographic processing composition. 3,870,520, Cl. 96-60.00R.

Shimanckas, William J.; and Beem, W. Wayne, to Outboard Marine Corporation. Pulley mounting system for electric outboards. 3,870,258, Cl. 248-4.000.

Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Aihara, Satoshi, to Tokyo Shibouro Electric Co., Ltd. Process for preparing a layer of compounds of groups II and VI. 3,870,558, Cl. 117-201.000.

Shin-Nihon Reiki Co., Ltd.: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Shinagawa, Susumu: *See—*
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,870,694.

Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,870,702.

Shinkai, Hiroyuki: *See—*
Katsushima, Atsuo; Hisamoto, Iwao; Fukui, Shoshin; Maeda, Chiaki; Iwatani, Akitoshi; Kato, Takahisa; Nagai, Masayuki; Shinkai, Hiroyuki; and Asaoka, Masayuki, 3,870,748.

Shioda, Toshio: *See—*
Yamamoto, Kenzo; Matsuoka, Seiichi; and Shioda, Toshio, 3,870,738.

Shiosaka, Makoto: *See—*
Hijiya, Hiromi; and Shiosaka, Makoto, 3,870,537.

Shipley Company, Inc.: *See—*
Dutkewych, Oleh Borys; and Hofmann, Lebert Arthur, 3,870,068.

Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, to Japan Gasoline Co., Ltd.; Shin-Nihon Reiki Co., Ltd.; Aza-yunohara; and Oaze-Futsuk-aichi. Cooling tower. 3,870,485, Cl. 55-257.000.

Shishido, Tadao: *See—*
Shimamura, Isao; Shishido, Tadao; Ohi, Reiichi; and Iwano, Haruhiko, 3,870,520.

Shisko, Walter S., to Domtar Limited. Fibrous board products having improved surface. 3,870,544, Cl. 117-60.000.

Shobert, Samuel M. Carbon-fluorocarbon fiber-plastic composite bearing. 3,870,589, Cl. 161-47.000.

Shofu Dental Corporation: *See—*
Thorburn, Fred T., 3,869,796.

Shonebarger, Francis J.: *See—*
Brown, William L.; and Shonebarger, Francis J., 3,870,015.

Shoup, Robert D.: *See—*
Farrauto, Robert J.; Hoekstra, Karl E.; and Shoup, Robert D., 3,870,658.

Shumaker, Gary Allen, to Lubrizol Corporation, The. Silicate-and Hydroxide-containing cleaning compositions, and liquid concentrates for the preparation thereof. 3,870,560, Cl. 134-2.000.

Shuman, Richard F.: *See—*
Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., 3,870,753.

Shutoh, Masamichi, to Nippon Electric Company, Limited. Graphic pattern generation for a tv-like scanned-graphic display equipment. 3,870,922, Cl. 315-383.000.

Sibley, Henry C., to General Signal Corporation. Ballast resistance and track continuity indicating circuit. 3,870,952, Cl. 324-65.00R.

Siclari, Francesco; Maderno, Cesano; Magnoni, Franco; and Fulmini, Sergio, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Apparatus for the continuous performance of chemical processes, more particulary esterification, and/or transesterification and polycondensation processes. 3,870,475, Cl. 23-285.000.

Siebe Gorman & Company Limited: *See—*
Bell, Alfred Wharton, 3,869,726.

Siemens Aktiengesellschaft: *See—*
Ammann, Ernst, 3,870,885.
Bertling, Anton, 3,869,990.
Darre, Allan; and Springstubbe, Wolf, 3,870,827.
Kipke, Eberhard; and Losensky, Erich, 3,870,912.
Krause, Gerhard, 3,870,976.
Nitsche, Herbert; and Hufnagl, Johann, 3,870,930.
Oesterhelt, Gerhard; Winkler, Josef; Falkenberg, Dieter; and de Bucs, Eugen Szabo, 3,870,568.
Pollmann, Fritz, 3,870,980.
Schicketanz, Dieter, 3,870,395.

Siems, Ruth M.; Capossela, Anthony C., Jr.; Halligan, John F.; and Wyss, C. Robert, to General Foods Corporation. Instant stuffing mix. 3,870,803, Cl. 426-128.000.

Simeth, Claus, to Roland Offsetmaschinenfabrik & Schleicher AG. Device for aligning the sheets on the feed table of sheet-fed machines, particularly offset printing presses. 3,870,293, Cl. 271-231.000.

Simms, Ross P.: *See—*
Hayes, Lester P.; Robinson, John W.; Simms, Ross P.; and Russell, Millard E., 3,870,805.

Simons, Charles William: *See—*
Holdsworth, Robert S.; O'Neill, Gerald Joseph; and Simons, Charles William, 3,870,797.

Simpson, Richard R. Tool for aligning articles. 3,869,784, Cl. 29-272.000.

Sincock, Thomas F., to Monsanto Company. Molecularly oriented bottle. 3,870,181, Cl. 215-1.00C.

Singer Company, The: *See—*
Schindel, Arnold, 3,869,963.

Singhal, Gopal H.: *See—*
Makowski, Henry S.; Lundberg, Robert D.; and Singhal, Gopal H., 3,870,841.
SKB Arms Company: *See—*
Iino, Hideo; and Iizuka, Satoru, 3,870,306.
Skelding, Kenneth George: *See—*
Jack, Harry Ross Scarlett; Richards, Peter Henry; and Skelding, Kenneth George, 3,870,500.
Skibbe, Harold A.; and Skibbe, John H., to Skibbe Manufacturing Co., Inc. Spreader with agitator to break up material bridging. 3,870,202, Cl. 222-226.000.
Skibbe, John H.: *See—*
Skibbe, Harold A.; and Skibbe, John H., 3,870,202.
Skibbe Manufacturing Co., Inc.: *See—*
Skibbe, Harold A.; and Skibbe, John H., 3,870,202.
Skobel, Barry A. Surgically implantable joint prosthesis. 3,869,730, Cl. 3-1.000.
Skretting, Hans; and Egeland, Ole, to Elkem-Skigerverket A/S. Scrapers for pelletizing disks. 3,870,447, Cl. 425-225.000.
Slates, Harry L.: *See—*
Wendler, Norman L.; Taub, David; Slates, Harry L.; and Zelawski, Zbigniew S., 3,870,747.
Slawson, Newell E. Pneumatic drill apparatus. 3,870,113, Cl. 175-96.000.
Sleiher, Sigmund: *See—*
Lazaroiu, Dumitru Florian; Sleiher, Sigmund; and Mihaiescu, Gheroghe Mihai, 3,869,788.
Smid, Peter Max: *See—*
Henniger, Peter Wolfgang; and Smid, Peter Max, 3,870,705.
Smit Nymegen B.V.: *See—*
Graat, Johannes W., 3,870,456.
Smith, Albert C. Liquid propulsion apparatus and method of fabrication. 3,869,775, Cl. 29-156.80R.
Smith, Cecil R., Jr.: *See—*
Powell, Richard G.; and Smith, Cecil R., Jr., 3,870,727.
Smith, Charles L.: *See—*
Minnick, Leonard John; Smith, Charles L.; and Webster, William C., 3,870,535.
Smith, Colin, to Oxy Metal Finishing Corporation. Scale modifier for phosphate solutions. 3,870,573, Cl. 148-22.000.
Smith, Colin Howard Stanwell; Gosling, Alexander Bennett; and Buchanan, Donald George, to Decca Limited. Disc mounting arrangement. 3,870,321, Cl. 274-39.00A.
Smith, Gordon C.: *See—*
Capossela, Anthony C.; McGuire, Michael T.; Smith, Gordon C.; and Albaum, Joseph D., 3,870,806.
Smith, Joseph Leigh. Candle shaping apparatus. 3,869,794, Cl. 30-278.000.
Smith, Kent F.; and Huber, Robert J., to General Instrument Corporation. Method and apparatus for maintaining the charge on a storage node of a mos circuit. 3,870,901, Cl. 307-238.000.
Smith, Michael; Hackett, Charles F.; and Radler, Richard W., to Xerox Corporation. Method of imaging photoconductor in change transport binder. 3,870,516, Cl. 96-1.500.
Smith, Ray S.: *See—*
Swidler, Ronald; Smith, Ray S.; and Miller, Harry A., 3,870,555.
Smith, Richard C.: *See—*
Waugh, Theodore R.; Smith, Richard C.; Anzel, Sanford H.; and Orofino, Caesar F., 3,869,731.
Snelling, Murdock M., Jr., to Taylor Machine Works. Apparatus for connecting a spreader assembly to a vehicle lift. 3,870,180, Cl. 214-621.000.
Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco; Maderno, Cesano; Magnoni, Franco; and Fulmini, Sergio, 3,870,475.
Snook, John Robert: *See—*
Towner, Frank Richard; and Snook, John Robert, 3,870,216.
Towner, Frank Richard; and Snook, John Robert, 3,870,217.
Snow Brand Milk Products Co., Ltd.: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.
Snyder, William Lee: *See—*
Hanser, Paul Edmund; and Snyder, William Lee, 3,870,074.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Rivetta, Gianfranco; and Marcotti, Egidio, 3,870,840.
Societe anonyme dite: Richier: *See—*
Leroy, Maurice, 3,870,226.
Societe Anonyme: Reveils Bayard: *See—*
Forest, Edmond, 3,869,930.
Societe d'Etudes du Procede Noridem: *See—*
Glaser, Heinz; and Zlatareff, Vassil, 3,870,539.
Societe En Commandite Par Actions: Etablissements M. Caulliez Et Delaoutre: *See—*
Gosse, Francoise, 3,870,207.
Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See—*
Coulon, Andre, 3,869,777.
Societe Herve & Fils, Papeteries du Sentier (Societe Anonyme): *See—*
Serra, Arthur Bienvenu Dalla, 3,869,950.
Societe National D'Etude et de Construction de Moteurs D'Aviation: *See—*
Lacroix, Armand Jean-Baptiste; Quillevere, Herve Alain; Cantaloube, Bernard Andre; and Caruel, Jacques Emile Jules, 3,869,865.
Sodler, Walter E., to Timex Corporation. Acoustical sound producer for clocks, especially for wristwatches. 3,869,855, Cl. 58-57.500.
Sola Basic Industries, Inc.: *See—*
Werych, Ewald R., 3,870,463.
Werych, Ewald R., 3,870,861.
Solitron Devices, Inc.: *See—*
D'Errico, John J., 3,870,962.
Sollami, Phillip A. Grinding wheel dresser. 3,870,030, Cl. 125-11.0TP.
Solomon, Milton, to Circle Engineering Co., Inc. Driven plastic small vehicle wheel. 3,870,371, Cl. 301-1.000.
Somlo, Tibor, to Ciba-Geigy AG. Process for the manufacture of N,N-disubstituted carbamic acid halides. 3,870,707, Cl. 260-239.00E.
Sony Corporation: *See—*
Chikazawa, Hiroyuki, 3,870,905.
Dosen, Masashi, 3,870,575.
Wakamiya, Kinji; and Kobayashi, Isamu, 3,871,007.
Spatz Corporation: *See—*
Spatz, Walter B., 3,870,200.
Spatz, Walter B., to Spatz Corporation. Valveless dispenser for fluent masses. 3,870,200, Cl. 222-206.000.
Spector, George: *See—*
Ward, John H.; and Spector, George, 3,870,403.
Spectrol Electronics Corporation: *See—*
Yungblut, Charles W.; and Hill, Robert D., Jr., 3,869,789.
Speech Technology Corporation: *See—*
Barton, William A.; and Stork, John E., 3,870,818.
Speed Selector, Inc.: *See—*
Fletcher, Peter C., 3,869,932.
Spencer, Benjamin F., to Spencer Industries, Inc. Waistband construction. 3,869,728, Cl. 2-221.000.
Spencer Industries, Inc.: *See—*
Spencer, Benjamin F., 3,869,728.
Spencer, Kenneth M., to Recycle Pallets Inc. Machine for stripping planks from frames. 3,869,783, Cl. 29-244.000.
Sperry Rand Corporation: *See—*
Espen, David A., 3,870,940.
Ihasz, Richard, 3,869,790.
Sperry Rand Limited: *See—*
Marshall, John Stephen, 3,870,322.
Towner, Frank Richard; and Snook, John Robert, 3,870,216.
Towner, Frank Richard; and Snook, John Robert, 3,870,217.
Spiessens, Raymond Francois, to U.S. Philips Corporation. Method eliminating discontinuities in a quartz article. 3,870,497, Cl. 65-32.000.
Spindler & Sauppe, Inc.: *See—*
Kirr, Frederick M., 3,870,408.
Spitalul Coltea: *See—*
Cadariu, Emil E.; and Macovei, Alexandru A., 3,870,037.
Spitzer, Nicholas A.: *See—*
Eberle, Arthur; and Spitzer, Nicholas A., 3,870,869.
Splitt, Theodore B.: *See—*
Baxter, Bobby G.; and Splitt, Theodore B., 3,870,342.
Springstubbe, Wolf: *See—*
Darre, Allan; and Springstubbe, Wolf, 3,870,827.
Sroka, Jurgen: *See—*
Werner, Udo; Biesen, Kurt; and Sroka, Jurgen, 3,870,269.
Staake, Walter: *See—*
Schlotterbeck, Heinz; and Staake, Walter, 3,869,938.
Staba, Edward A. Apparatus for the automatic charging of primer mix. 3,870,204, Cl. 222-262.000.
Stabilator AB: *See—*
Pulk, Elgas, deceased; and Noren, John Paul, 3,870,114.
Stacey, Martyn Hugh; and Tribbeck, Terrence Donald, to Imperial Chemical Industries Limited. Dehydrochlorination process. 3,870,762, Cl. 260-654.00D.
Stachowiak, John E.; and Goss, John B., to American Aero Inc. High pressure pump fluid end. 3,870,439, Cl. 417-454.000.
Stafford, Herbert Henry: *See—*
Lowey, Hans; and Stafford, Herbert Henry, 3,870,790.
Standard Brass and Manufacturing Company: *See—*
Wilson, Fred V.; and Leblanc, Henry J., Sr., 3,870,615.
Stanley Works, The: *See—*
Burgeson, Oscar Burge, 3,870,091.
Staples, Robert E.: *See—*
Gallant, James O.; Staples, Robert E.; and Knapp, George P., 3,869,774.
Stark, Martin H. Tube construction. 3,870,086, Cl. 138-172.000.
Starline, Inc.: *See—*
Ulrich, James K., 3,869,849.
Stauble, Max: *See—*
Ulrich, Paul; and Stauble, Max, 3,870,717.
Stauffer Chemical Company: *See—*
Chadha, Rajendra Nath, 3,870,766.
Stevenson, Joseph Eugene, 3,870,548.
Stauft, Daniel B. Method and apparatus for tenderizing meat. 3,869,755, Cl. 17-25.000.
Stave, Fredrick Roland, to RCA Corporation. Stylus control apparatus for a video disc record player. 3,870,835, Cl. 179-100.40R.
Steadley Company, Incorporated: *See—*
Lawrence, James Rogers, 3,869,738.

Steel, Margaret Lilian, to Imperial Chemical Industries Limited. Process for pigmenting a pile surfaced product. 3,870,778, Cl. 264-164.000.

Stefan, Mihaly; Hegedus, Zoltan; Balazs, Fulop; and Juhasz, Gyula, to Csepeli Femmu. Two stage heat treatment process for the production of unalloyed, cold-rolled electrical steel. 3,870,574, Cl. 148-122.000.

Stehl, Otto. Apparatus for manufacturing solid double layer sheet glass. 3,870,499, Cl. 65-156.000.

Stein, Werner; and Hartmann, Helmut, to Henkel & Cie GmbH. Continuous process for the separation of mixtures of fatty substances of different melting points. 3,870,735, Cl. 260-419.000.

Steinbatz, Alfred; and Kappl, Gerhard, to C. Reichert Optische Werke AG. Photomicrographic apparatus. 3,871,009, Cl. 354-79.000.

Steinberg, Richard W.; McClocklin, Samuel B.; and Kostelecky, Clarence L., to Owatonna Tool Company. Waste compactor. 3,869,978, Cl. 100-53.000.

Steiner, Hans: *See*—
Rellstab, Werner; and Steiner, Hans, 3,870,466.

Steiner, Robert E., to Emerson Electric Co. Floor drop-in forced circulation electric space heater. 3,870,860, Cl. 219-370.000.

Steinmetz, Floyd; and Thoms, William F., to Rotographic Machinery Company, The. Clamping and tensioning a sheet on a cylinder. 3,869,985, Cl. 101-415.100.

Stelron Cam Company: *See*—
Beezer, Earl F., 3,869,924.

Stemme, Walter. Hair detangling device. 3,870,056, Cl. 132-11.00A.

Stepan Chemical Company: *See*—
Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,870,768.

Stepanian, Ernst Arakelovich: *See*—
Sarkisov, Rafael Tevosovich; Stepanian, Ernst Arakelovich; and Bondarenko, Valentin Grigorievich, 3,870,244.

Sterling Drug Inc.: *See*—
Langstroth, Theodore A., 3,870,649.

Steury, Donald P. Pushbutton telephone printer/recorder. 3,870,821, Cl. 179-2.0DP.

Stevenson, Joseph Eugene, to Stauffer Chemical Company. Primer composition for heat curable silicone. 3,870,548, Cl. 117-72.000.

Stevenson, Robert L. Toilet stool air deodorizer structure. 3,869,737, Cl. 4-213.000.

Stoba AG: *See*—
Okle, Kurt, 3,870,267.

Stoffer, Cornelis Daniel, to Rockwell International Corporation. Receiver protection circuit apparatus. 3,870,899, Cl. 307-235.000.

Stoltenberg, Donald A.: *See*—
Kearns, Tommy Carter; and Stoltenberg, Donald A., 3,870,585.

Stone, Jerry F.: *See*—
Edds, Kenneth E.; Elbert, Donald L.; and Stone, Jerry F., 3,870,528.

Stora Kopparbergs Bergslags Aktiebolag: *See*—
Liljenzin, Jan-Olov; Reinhardt, Hans; and Rydberg, Helge Jan Arnold, 3,870,060.

Stork, John E.: *See*—
Barton, William A.; and Stork, John E., 3,870,818.

Stowell, Richard C.: *See*—
Hale, Richard W.; Tan, Patrick; Stowell, Richard C.; and Ordway, Donald E., 3,869,909.

Straitz, John F., III, to Combustion Unlimited Incorporated. Incinerator. 3,869,995, Cl. 110-18.00C.

Straw, Richard D., to International Telephone and Telegraph Corporation. VSWR alarm system. 3,870,957, Cl. 325-150.000.

Stringfellow, Jerry D., to General Tire & Rubber Company, The. Permanent flashpad for transfer molding. 3,870,449, Cl. 425-251.000.

Strom, James R.: *See*—
Plundo, Robert A.; Readal, Thomas C.; and Strom, James R., 3,870,626.

Strybel, Richard V., to Imperial-Eastman Corporation. Tube working tool. 3,870,432, Cl. 408-191.000.

Stubits, Marcella C.: *See*—
Teng, James; and Stubits, Marcella C., 3,870,701.

Stungis, George E.: *See*—
Heitkamp, Norman D.; Merker, Steven L.; and Stungis, George E., 3,870,053.

Stupar, Janex, to Institut Jozef Stefan. Laminar flame separate aerosol burner for use in atomic absorption spectroscopy. 3,870,234, Cl. 239-132.300.

Subsea Equipment Associates Limited: *See*—
Liautaud, Jean Alphonse Eugene, 3,870,345.

Suda, Syotaro: *See*—
Ishii, Akemi; and Suda, Syotaro, 3,869,928.

Suddeutsche Kalkstickstoff-Werke AG: *See*—
Aignesberger, Alois; Kriele, Ulrich; and Michaud, Horst, 3,870,671.

Sudduth, Jerome R.: *See*—
Walker, David G.; Keyworth, Donald A.; and Sudduth, Jerome R., 3,870,482.

Sugarman, Nathan: *See*—
Palmer, Nigel Innes; and Sugarman, Nathan, 3,870,567.

Sulcek, Charles E., to Whirlpool Corporation. Refuse compactor receptacle. 3,869,979, Cl. 100-218.000.

Sumitomo Chemical Company, Limited: *See*—
Kusayama, Seiji; Ohashi, Koichi; and Takada, Shinzo, 3,870,675.

Sumitomo Metal Industries Limited: *See*—
Matsuki, Norio, 3,870,351.

Summerlin, Dorsey: *See*—
Hartman, John R.; and Summerlin, Dorsey, 3,869,727.

Sun Chemical Corporation: *See*—
Myers, John L., 3,870,931.

Sun Oil Company: *See*—
Tice, John D.; and Benner, Robert I., 3,870,624.

Sun Ventures, Inc.: *See*—
Angstadt, Howard P., 3,870,745.

Surletta, Zygmunt M., to Lear Siegler Inc. Spring assembly. 3,869,740, Cl. 5-354.000.

Survival Technology, Inc.: *See*—
Sarnoff, Stanley J., 3,870,035.

Suzuki, Kazuo, to Alps Electric Co., Ltd. Actuating means for AFC defeat switch. 3,870,961, Cl. 325-457.000.

Suzuki, Shintari: *See*—
Takamura, Isutomu; Kanada, Yoshimi; and Suzuki, Shintari, 3,870,564.

Suzuki, Tomohide; and Aoki, Toshio, to Victor Company of Japan, Limited. Microphone with different directional modes. 3,870,820, Cl. 179-1.0DM.

Svenska Industrietablerings AB (Svetab) Swedish Industrial Establishing Corporation: *See*—
Hasfjord, Morten Birger, 3,870,090.

Svirsky, Viktor Alexandrovich: *See*—
Rannev, Alexandr Vladimirovich; Reish, Arvid Karlovich; Svirsky, Viktor Alexandrovich; and Khodykin, Boris Danilovich, 3,869,814.

Swagerty, Arnold: *See*—
Mathews, Carl S.; and Swagerty, Arnold, 3,870,999.

Swart, Gary M., to Estey Corporation. Shiftable cable support. 3,870,260, Cl. 248-49.000.

Swenson, Marshall G.: *See*—
Getman, Darryl L.; and Swenson, Marshall G., 3,870,597.

Swidler, Ronald; Smith, Ray S.; and Miller, Harry A., to Burlington Industries, Inc. Aryl stearic acid treated textiles. 3,870,555, Cl. 117-138.80F.

Swinford, Gary D.: *See*—
Verlinden, Jerry M.; and Swinford, Gary D., 3,869,875.

Syracuse University Research Corp.: *See*—
Aldrich, Robert G., 3,870,237.

Syson, John William; and Kerridge, John Charles, to Imperial Chemical Industries Limited. Surface coating compositions which comprise alkyd resin and non-aromatic petroleum resin. 3,870,667, Cl. 260-22.0CB.

Szekely, Andrew Geza, to Union Carbide Corporation. Process for refining molten aluminum. 3,870,511, Cl. 75-68.00R.

Szenger, Franz: *See*—
Neuer, Harald; Szenger, Franz; Herzog, Klaus; and Neumann, Joachim, 3,869,799.

Tabacek, Joseph A.; Taylor, Brian W.; and Vogel, Roger F., to Gulf Research & Development Company. Process for coating a catalyst support. 3,870,545, Cl. 117-71.00R.

Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Robkuo. Process for preparing heavy water from sea water. 3,870,606, Cl. 203-5.000.

Tabata, Norimasa: *See*—
Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Robkuo, 3,870,606.

Tachikawa Research Institute: *See*—
Asadea, Takashi; and Okamoto, Shin, 3,870,596.

Taco-Tafel GmbH Co., KG: *See*—
Laass, Heinz, 3,870,950.

Taillardat, Jacques, to La Technique Integrale. Mechanism for converting a movement of translation into a rotational movement, and vice versa. 3,869,936, Cl. 74-459.000.

Takada, Shinzo: *See*—
Kusayama, Seiji; Ohashi, Koichi; and Takada, Shinzo, 3,870,675.

Takahashi, Nobuaki; and Kasuga, Masao, to Victor Company of Japan, Ltd. Circuit arrangement of voltage controlled oscillator. 3,870,971, Cl. 331-108.00D.

Takahashi, Yasuo; and Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide, angle, high aperture ratio, long back focus lens system. 3,870,402, Cl. 350-214.000.

Takamura, Isutomu; Kanada, Yoshimi; and Suzuki, Shintari, to Tokyo Shibaura Electric Co., Ltd. Alkaline cell. 3,870,564, Cl. 136-30.000.

Takarada, Eiichi. Buffer circuit for pulse transmission. 3,870,902, Cl. 307-247.000.

Takata, Yoshinori: *See*—
Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Ianno, Kazuo; and Okajima, Yoshiaki, 3,870,603.

Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko; Kobayashi, Shigeru; Obayashi, Mikihiko; Shinagawa, Susumu; and Fukuda, Tsunehiko, 3,870,694.

Takenaka, Senji: *See*—
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Takenaka, Toshisuke: *See*—
Miyoshi, Isao; Sanjo, Sadao; Takenaka, Toshisuke; Mizutani, Shoji; Hamana, Isao; and Hayashi, Seiichi, 3,870,637.

Takeuchi, Hideo, to Minolta Camera Kabushiki Kaisha. Automatic diaphragm setting apparatus for camera. 3,871,006, Cl. 354-40.000.

Takeuchi, Shinjiro; and Ichioka, Satoshi, to Mishima Kosan Co., Ltd. Input magnetic field sensing system with utilization of a hysteresis phenomenon. 3,870,973, Cl. 332-12.000.

Talley, Lloyd A.: *See*—
Eubanks, Edward F.; and Talley, Lloyd A., 3,869,781.

Tamny, Simon Z.: *See—*
Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., 3,870,375.

Tan, Patrick: *See—*
Hale, Richard W.; Tan, Patrick; Stowell, Richard C.; and Ordway, Donald E., 3,869,909.

Tanaka, Kyugo; Oshima, Shozo; and Watanabe, Itaru, to Asahi Kasei Kogyo Kabushiki Kaisha. Preparation of oxidation products of cycloalkanes. 3,870,760, Cl. 260-586.00P.

Taneya, Shinichi: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Tangorra, Giorgio, to Industrie Pirelli S.p.A. Pneumatic tire for vehicle wheels with inwardly directed sidewall convexity. 3,870,095, Cl. 152-353.00C.

Taniguchi, Hideo, to Toyo Electronics Industry Corporation. Thermal printing head. 3,870,856, Cl. 219-216.000.

Taniguchi, Koichi: *See—*
Toyama, Koichi; and Taniguchi, Koichi, 3,870,911.

Tannenberger, Helmut: *See—*
Charbonnier, Jean-Claude; and Tannenberger, Helmut, 3,870,561.

Tanno, Naoichiro, to Shimadzu Seisakusho Ltd. Method and apparatus for lacing a skein of yarn. 3,869,769, Cl. 28-21.000.

Tapiei, Fa-Kuei Liu. Automatic telephone dialer. 3,870,830, Cl. 179-90.0CS.

Tapley, Claude D.: *See—*
Bray, Robert S.; and Tapley, Claude D., 3,869,899.

Tappan Company, The: *See—*
Perl, Richard L., 3,870,457.

Taszer, Emil: *See—*
Gruszecki, Wojciech; Taszer, Emil; and Borowski, Edward, 3,870,708.

Tatebe, Horoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Tuning pin for piano. 3,869,953, Cl. 84-201.000.

Tateishi, Teizaburo: *See—*
Kubota, Hayato; Nakayama, Sadao; and Tateishi, Teizaburo, 3,870,733.

Taub, David: *See—*
Wendler, Norman L.; Taub, David; Slates, Harry L.; and Zelawski, Zbigniew S., 3,870,747.

Taunton-Rigby, Alison: *See—*
Knott, Roger L.; and Taunton-Rigby, Alison, 3,870,719.

Taylor, Brian W.: *See—*
Tabacek, Joseph A.; Taylor, Brian W.; and Vogel, Roger F., 3,870,545.

Taylor & Challen Limited: *See—*
Plaister, John Edward; and Cole, Leonard Edward, 3,869,893.

Taylor, Clarence. Apparatus for orienting and feeding articles. 3,870,194, Cl. 221-160.000.

Taylor, Leo Ottis, to Xerox Corporation. Phase controlled power supply. 3,870,903, Cl. 307-252.00N.

Taylor Machine Works: *See—*
Snelling, Murdock M., Jr., 3,870,180.

Technic Inc.: *See—*
Weisberg, Alfred M.; and Butler, Florence P., 3,870,619.

Technomatic A.G.: *See—*
Ruchser, Erich; and Ott, Helmut, 3,870,073.

Tectonics Research Ireland Limited: *See—*
Timoney, Seamus G., 3,869,866.

Tedesh, George E. Window awning. 3,869,838, Cl. 52-76.000.

Teijin Limited: *See—*
Yamashita, Gentaro; and Yamamoto, Kiyoshi, 3,870,754.

Telefonaktiebolaget L M Ericsson: *See—*
Ouvrier, Gunther, 3,870,955.

Teng, James; and Stubits, Marcella C., to Anheuser-Busch, Incorporated. Benzyl hydroxypropyl cellulose acetate and process. 3,870,701, Cl. 260-226.000.

Tenneco Chemicals, Inc.: *See—*
Walker, David G.; Keyworth, Donald A.; and Sudduth, Jerome R., 3,870,482.

Tenney, Ralph J., to C. J. Patterson Company. Dough conditioning composition and method. 3,870,799, Cl. 426-62.000.

Tension Envelope Corporation: *See—*
Kranz, Richard, 3,869,964.

Teodorescu, Constantin Gh.; and Ardeleanu, Stefan P., to Institutul Pentru Creatie Stintifica Si Technica-Increst. Process and plant for pneumatic transport. 3,870,250, Cl. 243-6.000.

Tepas, Joseph J., Jr.; and Sangster, Arlon G., to Olin Corporation. Dissolving apparatus. 3,870,471, Cl. 23-267.00E.

Terakado, Seishi: *See—*
Kato, Nobuo; Nakamura, Toshio; and Terakado, Seishi, 3,870,983.

Terakawa, Kazuo: *See—*
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Aihara, Satoshi, 3,870,558.

Ter Haar, Gary L.: *See—*
Mitchell, Lawrence C.; and Ter Haar, Gary L., 3,870,679.

Terra-Tex Corporation: *See—*
Gidge, Lester, 3,870,583.

Tessier, Joseph Donatien Leo. Sliding game piece having friction reduction air cushion. 3,870,309, Cl. 273-128.0CS.

Tetsudo Kizai Kogyo Company Limited: *See—*
Toyama, Shigetaro; and Matsuo, Yoshio, 3,870,231.

Texaco Exploration Canada Ltd.: *See—*
McKay, Alexander S., 3,870,879.

Texaco Inc.: *See—*
Ashton, William B.; Gonzalez, Luis A.; Nelson, Gerald V.; and Mead, Theodore C., 3,870,622.
McCoy, Frederic C.; and Cole, Edward L., 3,870,765.

Textron Inc.: *See—*
DeCaro, Charles J., 3,869,942.
Gorski, Walter, 3,870,125.

Tezuka, Shigeru: *See—*
Sato, Masamichi; and Tezuka, Shigeru, 3,870,514.

Theissen, Ferdinand: *See—*
Lussling, Theodor; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,870,746.

Theodore, Paris, to Seventrees, Ltd. Handcuff case. 3,870,208, Cl. 224-2.00F.

Thermo-Rite Mfg. Co., The: *See—*
Lydle, John E.; and Yakubik, Charles F., 3,870,032.

Theurer, Josef: *See—*
Plasser, Franz, deceased; Theurer, Josef; and Schubert, Egon, 3,869,907.

Thiel, Anton: *See—*
Gilles, Martin; and Thiel, Anton, 3,870,337.

Thiel, Frank L.: *See—*
Racki, Jerome G.; and Thiel, Frank L., 3,870,396.

Thomas, John M., to Elliott-Williams Company, Inc. Door structure for large freezer. 3,869,873, Cl. 62-275.000.

Thompson, James Douglas: *See—*
Gale, William F.; and Thompson, James Douglas, 3,869,742.

Thoms, William F.: *See—*
Steinmetz, Floyd; and Thoms, William F., 3,869,985.

Thomson-CSF: *See—*
Mathieu, Raymond, 3,869,935.
Peyrard, Yves; and Renault, Jean-Claude, 3,870,923.

Thorburn, Fred T., to Shofu Dental Corporation. Slotted chuck for tool holder. 3,869,796, Cl. 32-26.000.

Thornburgh, William F., to General Motors Corporation. Engine and valve cover therefor having integral air gallery. 3,869,859, Cl. 60-305.000.

Tibbals, Edward Camp, Jr. Container. 3,870,190, Cl. 220-338.000.

Tice, John D.; and Benner, Robert L., to Sun Oil Company. Hydrogenation catalyst activation. 3,870,624, Cl. 208-143.000.

Tieman, Lloyd E. Fishhook extractor. 3,869,822, Cl. 43-53.500.

Tile, German Tomasovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.

Times Wire and Cable Compnay: *See—*
Peoples, Dennis Robert; and Maack, David Ralph, 3,870,977.

Timex Corporation: *See—*
Sodler, Walter E., 3,869,855.

Timmerbeil, Karl-Ernst, to Packautomatic GmbH & Co. K.G., Firma. Folding device for packaging machines. 3,869,846, Cl. 53-182.000.

Timoney, Seamus G., to Tectonics Research Ireland Limited. Internal combustion engine turbocharger drives and controls. 3,869,866, Cl. 60-607.000.

Titterington, Joseph Bell: *See—*
Jackson, Sydney; and Titterington, Joseph Bell, 3,871,018.

Tjurin, Valery Fedorovich: *See—*
Panferov, Viktor Mikhailovich; Grunin, Lev Petrovich; Ilin, Lev Mikhailovich; Privalov, Mikhail Moiseevich; Filatov, Andrei Dmitrievich; Ovchinnikov, Gennady Elizarovich; Antipin, Vadim Grigorievich; Lednov, Viktor Andreevich; Tjurin, Valery Fedorovich; Rutman, Dmitry Samuilovich; Basias, Igor Pavlovich; and Tile, German Tomasovich, 3,869,996.

Tocci, Mario Peter: *See—*
Kietzman, John Howard; and Tocci, Mario Peter, 3,870,426.

Tokico Ltd.: *See—*
Ishii, Akemi; and Suda, Syotaro, 3,869,928.

Tokuyama Soda Kabushiki Kaisha: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Tokyo Metropolitan Government: *See—*
Mita, Ikuo, 3,870,608.

Tokyo-Shibaura Eelctric Co., Ltd.: *See—*
Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, 3,870,944.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Takamura, Isutomu; Kanada, Yoshimi; and Suzuki, Shintari, 3,870,564.

Tokyo Shibouro Electric Co., Ltd.: *See—*
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Aihara, Satoshi, 3,870,558.

Tolbird, Paul D. Static switching control. 3,870,877, Cl. 250-209.000.

Tolson, Ray C., Jr.: *See—*
Tolson, Ray C., Sr.; and Tolson, Ray C., Jr., 3,870,804.

Tolson, Ray C., Sr.; and Tolson, Ray C., Jr. Preparation of fried parboiled rice and the resulting product. 3,870,804, Cl. 426-141.000.

Tombs, Michael Peter, to Lever Brothers Company. Fluid aqueous protein compositions and food products prepared therefrom. 3,870,801, Cl. 426-92.000.

Tomita, Shinjiro: *See—*
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Tomokawa, Hisao: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Tonichi Manufacturing Co., Ltd.: *See—*
Tsuji, Hiroshi, 3,869,941.

Tooze, Michael John; and Knight, Peter Michael, to Elliott Brothers (London) Limited. Waveform generator and phase shifter. 3,870,938, Cl. 318-605.000.

Torck, Bernard; Derrien, Michel; and Franck, Jean-Pierre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Modified halogenated alumina catalyst for isomerizing saturated hydrocarbons. 3,870,653, Cl. 252-429.00R.

Torgersen, Ole: *See—*
Kleppe, Byrge; and Torgersen, Ole, 3,870,081.

Torkildsen, Robert A.: *See—*
Dempsey, Russell M.; Nolan, Mary E.; La Conti, Anthony B.; and Torkildsen, Robert A., 3,870,616.

Toromanoff, Edmond: *See—*
Martel, Jacques; Toromanoff, Edmond; and Buendia, Jean, 3,870,710.
Martel, Jacques; Buendia, Jean; and Toromanoff, Edmond, 3,870,711.

Torrington, Leslie Albert, to RCA Corporation. Pickup arm control for video disc player. 3,870,320, Cl. 274-23.00A.

Tosi, Arduino. Kinematic transmission devices. 3,869,929, Cl. 74-112.000.

Toth, Thomas Daniel, to Addressograph-Multigraph Corporation. Fluid film thickness sensor and control system for utilizing same. 3,869,984, Cl. 101-349.000.

Tournut, Claude: *See—*
Grimaud, Edouard; and Tournut, Claude, 3,870,691.

Towner, Frank Richard; and Snook, John Robert, to Sperry Rand Limited. Data recorders. 3,870,216, Cl. 226-181.000.

Towner, Frank Richard; and Snook, John Robert, to Sperry Rand Limited. Data recorders. 3,870,217, Cl. 226-188.000.

Toyama, Koichi; and Taniguchi, Koichi, to Nippondenso Co., Ltd. Wheel speed detector for vehicles. 3,870,911, Cl. 310-155.000.

Toyama, Shigetaro; and Matsuo, Yoshio, to Tetsudo Kizai Kogyo Company Limited. Rail fastening device. 3,870,231, Cl. 238-324.000.

Toyo Electronics Industry Corporation: *See—*
Taniguchi, Hideo, 3,870,856.

Toyoboseki Kabushiki Kaisha: *See—*
Makimura, Osamu; and Goto, Teruo, 3,870,688.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; Mitsui, Ryozo; and Ishikawa, Norikatsu, 3,869,858.
Senda, Katsuyuki; and Kobashi, Mamoru, 3,870,918.

Trammell, Earl M., Jr. Container unit for an automobile. 3,870,210, Cl. 224-42.45R.

Travers, Hal, to Seneca Chemicals, Inc. Liquid cleaning agent. 3,870,647, Cl. 252-118.000.

Treace, Harry T., to Richards Manufacturing Company. Cutting blade for use with an oscillating cast cutter. 3,869,795, Cl. 30-388.000.

Tribbeck, Terrence Donald: *See—*
Stacey, Martyn Hugh; and Tribbeck, Terrence Donald, 3,870,762.

Triplex Safety Glass Company Limited: *See—*
Jack, Harry Ross Scarlett; Richards, Peter Henry; and Skelding, Kenneth George, 3,870,500.

Tritten, Donald E.: *See—*
Mackey, E. Scudder; Pechmann, Karl; and Tritten, Donald E., 3,870,521.

Troussier, Maurice: *See—*
Grimaud, Edouard; and Troussier, Maurice, 3,870,767.

Tsao-Wu, Nelson Tsin: *See—*
Carbrey, Robert Lawrence; Moran, John Christian; and Tsao-Wu, Nelson Tsin, 3,870,826.

Tsuchiya, Takashi: *See—*
Inoue, Michiro; Ishikawa, Masayuki; Tsuchiya, Takashi; and Shimamoto, Takio, 3,870,792.

Tsuji, Hiroshi, to Tonichi Manufacturing Co., Ltd. Torque wrench. 3,869,941, Cl. 81-52.500.

Tucker, Gerald L.: *See—*
Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., Jr., 3,870,782.

Tull, Herbert G., III, to Hoerner Waldorf Corporation. Stacking and transferring unit. 3,870,166, Cl. 214-6.0BA.

Tull, Roger J.; Czaja, Robert F.; Shuman, Richard F.; and Pines, Seemon H., to Merck & Co., Inc. Process for preparing indenyl acetic acids. 3,870,753, Cl. 260-515.00A.

Tums, Valdis M., to Union Carbide Corporation. Shirred casing stick with reverse helical fold pattern. 3,869,756, Cl. 17-49.000.

Tuomela, Robert M.; Schroeder, Gustave W.; and Mattila, Robert O., to Reserve Mining Company. Feed rate control for jet piercer. 3,870,111, Cl. 175-11.000.

Turner, William R., to Automation Industries, Inc. Hybrid carrier beam sonar. 3,870,988, Cl. 340-3.00R.

Tyco Laboratories, Inc.: *See—*
Labelle, Harold E., Jr., 3,870,477.

Tylinski, Raymond S., to Rock Industries Machinery Corporation. Screen tensioning device. 3,870,630, Cl. 209-403.000.

Tymann, Gerhard, to Messerschmitt-Bolkow-Blohm Gesellschaft Mit Beschrankter Hoftung. Wide-band vertically polarized omnidirectional antenna. 3,871,000, Cl. 343-771.000.

U.C.C. International Limited: *See—*
Button, David; and Hopkins, Philip Ward, 3,870,908.

Uchida, Yasuo; and Kuroyanagi, Yoshitaka, to Konishiroku Photo Industry Co., Ltd. Automatic exposure control means for a camera. 3,871,005, Cl. 354-38.000.

Ueda, Hiroshi: *See—*
Okumoto, Takeomi; Ueda, Hiroshi; Sakai, Junji; and Shimada, Yogo, 3,870,529.

Uhlig, Klaus: *See—*
Kappeler, Peter; and Uhlig, Klaus, 3,870,346.

Ullman, Howard M., Jr.: *See—*
Lautzenheiser, Robert D.; and Ullman, Howard M., Jr., 3,870,239.

Ulrich, James K., to Starline, Inc. Ground engaging hay bale rolling apparatus. 3,869,849, Cl. 56-343.000.

Ulrich, Paul; and Stauble, Max, to Ciba-Geigy AG. New vat dyestuffs, their manufacture and use. 3,870,717, Cl. 260-249.000.

Umbaugh, Charles Wayne, to Honeywell Information Systems Inc. Method for precisely aligning circuit devices coarsely positioned on a substrate. 3,869,787, Cl. 29-577.000.

UMC Industries, Inc.: *See—*
Carter, Ronald W.; and Nash, Charles D., 3,870,629.
Woltjen, Duane W., 3,870,142.

Umezu, Hideo, to International Fastener Establishment. Press-on and split-off type fastener and manufacturing device therefor. 3,869,764, Cl. 24-204.000.

Unbehaun, Olaf; Hampel, Uwe; Scholz, Norbert; Gassmann, Horst; Schneider, Walter; Hesser, Heinz; Herrmann, Walter; and Bechert, Bertold, to BASF Aktiengesellschaft; and Heinrich Cronau, Building Contractors. Consolidating ballast. 3,869,988, Cl. 104-11.000.

Uncapher, Richard Danby, to International Telephone and Telegraph Corporation. Method of making a perforate wafer from filamentary material. 3,870,579, Cl. 156-174.000.

Underwood, John Duckles, to International Standard Electric Corporation. Selenium deposition. 3,870,614, Cl. 204-181.000.

Ungerer, Frau Irma: *See—*
Rodach, Alexander; and Weber, Hans, 3,869,845.

Unic Corporation: *See—*
Nakajo, Toshihiro, 3,870,162.

Unifoam AG: *See—*
Petzetakis, Nicholas George, 3,870,441.

Union Carbide Corporation: *See—*
Szekely, Andrew Geza, 3,870,511.
Tums, Valdis M., 3,869,756.

Union Oil Company of California: *See—*
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 3,870,668.

Unisearch Limited: *See—*
Huey, Richard Meredith; and Rajaratnam, Krishna, 3,870,925.

United States of America
Agriculture: *See—*
Powell, Richard G.; and Smith, Cecil R., Jr., 3,870,727.
Army: *See—*
Nichols, Peter L., Jr., 3,870,578.
Pearlstein, Fred; and Weightman, Robert F., 3,870,526.
Atomic Energy Commission: *See—*
Oltman, Billie G.; Eckerman, Keith F.; Romberg, Gerald P.; and Prepejchal, William, 3,869,918.
Wolowodiuk, Walter, 3,870,099.
Health Education and Welfare: *See—*
Knott, Roger L.; and Taunton-Rigby, Alison, 3,870,719.
National Aeronautics and Space Administration: *See—*
Gedwill, Michael A.; and Grisaffe, Salvatore J., 3,869,779.
Navy: *See—*
DiPerry, John, 3,870,997.
Hills, Marian E.; and Ayres, William M., 3,870,577.
Hughes, Richard Smith, 3,870,906.
Miller, Raymond B., 3,870,996.
Nielson, Robert L., 3,870,995.

U.S. Philips Corporation: *See—*
Buurman, Herman, 3,870,498.
De Fraeye, Dirk Jules Remi; and Mewissen, Jan Alfons Catharina, 3,870,920.
Reinhoudt, Jacobus Pieter, 3,870,382.
Spiessens, Raymond Francois, 3,870,497.
Van Daalen, Jan Johannes; and Daams, Jasper, 3,870,504.

U.S. Phillips Corporation: *See—*
Van Roosmalen, Johannes H. T., 3,870,002.

University of California, The Regents of the: *See—*
Waugh, Theodore R.; Smith, Richard C.; Anzel, Sanford H.; and Orofino, Caesar F., 3,869,731.

University of Illinois Foundation: *See—*
Flygare, Willis H.; and Ware, Bennie R., 3,870,612.

University of Utah: *See—*
Cutler, Ivan B., 3,870,496.

Uno, Hitoshi; and Irie, Akira, to Dainippon Pharmaceutical Co. Ltd. Process for preparing pyridoxal-5'-monophosphate. 3,870,724, Cl. 260-297.00V.

Unxov, Evgeny Pavlovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich;

Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Upjohn Company, The: *See—*
Bannister, Brian, 3,870,699.
Collins, Robert J., 3,870,793.
Farrissey, William J., Jr.; and Rausch, Karl W., Jr., 3,870,674.
Kaugars, Girts, 3,870,505.

Urano, Fumio: *See—*
Nomura, Katsuhiko; Kurei, Hiroshi; and Urano, Fumio, 3,871,011.

USC Incorporated: *See—*
Apt, Jerome, Jr.; Wachter, William J.; and Rohrer, Wesley M., Jr., 3,870,078.

USM Corporation: *See—*
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 3,870,445.

USM Corporation of Flemington, New Jersey: *See—*
Meyer, Engelbert A., 3,869,760.

Uthenwoldt, Frederick W., to Pitney-Bowes, Inc. Locking system. 3,869,885, Cl. 70-315.000.

Valentine, Charles G., to Xerox Corporation. Educational device for learning the oscilloscope. 3,869,811, Cl. 35-19.00A.

Valera, Marco: *See—*
Modena, Mario; Ragazzini, Mario; Borsini, Giancarlo; and Valera, Marco, 3,870,689.

Valle, Howard C.: *See—*
Hardiman, Russell J.; Leiter, Leigh David; and Valle, Howard C., 3,870,263.

Valmar Swimming Pools Ltd.: *See—*
Valois, Marcel; and Valois, Kenneth, 3,869,736.

Valois, Kenneth: *See—*
Valois, Marcel; and Valois, Kenneth, 3,869,736.

Valois, Marcel; and Valois, Kenneth, to Valmar Swimming Pools Ltd. Collapsible swimming pool. 3,869,736, Cl. 4-172.190.

Valspar Corporation, The: *See—*
Pipkins, David D., 3,870,651.

Valve Systems International, Inc.: *See—*
Graham, Donald E.; and Battaglia, Larry A., 3,870,071.

Van Dyk Research Corporation: *See—*
Landrith, James Edward, 3,870,197.

Van Daalen, Jan Johannes; and Daams, Jasper, to U.S. Philips Corporation. Cycloalkylphenyl ureas as herbicides. 3,870,504, Cl. 71-120.000.

Vandenbroucke, Gilbert, to N. V. Behaert S.A. Arc welding electrode. 3,870,854, Cl. 219-145.000.

Vandenkieboom, John, to La Salle Machine Tool, Inc. Piston turning machine. 3,869,947, Cl. 82-19.000.

Vanderbilt, Vern C., Jr.; Zimmer, Clarence L.; and Van Ostrand, William F., to Dynamic Precision Controls Corporation. Oscillator and flow measuring apparatus. 3,870,972, Cl. 331-140.000.

Vander Louw, John F.: *See—*
Elton, Robert L.; and Vander Louw, John F., 3,870,593.

Vander Stel, Gerald L.: *See—*
Anderson, John D.; and Vander Stel, Gerald L., 3,869,827.

Van Dornick, Edward M. Maintenance of high heat exchange transfer rates and improved alkali desublimation conditions in portland cement production. 3,870,534, Cl. 106-100.000.

Van Ostrand, William F.: *See—*
Vanderbilt, Vern C., Jr.; Zimmer, Clarence L.; and Van Ostrand, William F., 3,870,972.

Van Roosmalen, Johannes H. T., to U.S. Phillips Corporation. Television camera tube with three electrode focusing lens. 3,870,002, Cl. 313-389.000.

Van Uitert, Legrand Gerard: *See—*
Dillon, Joseph Francis, Jr.; Madison, Ernst Michael Gyorgy; and Van Uitert, Legrand Gerard, 3,870,397.

Varga, Zoltan. Balloon balancing toy. 3,870,298, Cl. 273-1.00R.

Vasile, Carmine F., to Hazeltine Corporation. Surface wave transducer with reduced reflection coefficient. 3,870,975, Cl. 333-30.00R.

Vasilieva, Irina Nikolaevna: *See—*
Alexeeva, Alexandra Konstantinovna; Yakovleva, Ljudmila Alexandrovna; Vasilieva, Irina Nikolaevna; Andzhaparidze, Otar Georgievich; and Alexandrova, Angelina Nikolaevna, 3,870,598.

Vaughan, Curtis M. Multipurpose hygienic kit. 3,870,045, Cl. 128-229.000.

Vaughan, Merle E., to Peterson Machine Tool, Inc. Drill guide for enlarging engine valve stem guides. 3,869,803, Cl. 33-181.0AT.

Vaughn Corporation: *See—*
West, Roland J., 3,870,277.

Vayssiere, Pierre: *See—*
Martin, Daniel; and Vayssiere, Pierre, 3,870,510.

Veba-Chemie AG: *See—*
Ibing, Gunther; and Neubold, Kurt, 3,870,743.

Velsicol Chemical Corporation: *See—*
Hokama, Takeo, 3,870,732.

Verbeke, Henry. Bag sealing apparatus and method of use. 3,869,842, Cl. 53-14.000.

Verge, John Pomfret: *See—*
Hughes, Peter Graham; and Verge, John Pomfret, 3,870,725.

Verlinden, Jerry M.; and Swinford, Gary D., to Mile High Equipment Company. Ice chip or flake producing machine. 3,869,875, Cl. 62-354.000.

Vestal, George W. Processing of coal to produce liquid and vaporous hydrocarbons. 3,870,611, Cl. 204-168.000.

Viceroy Manufacturing Company Limited: *See—*
Luczkiw, John, 3,870,183.

Victor Company of Japan, Limited: *See—*
Suzuki, Tomohide; and Aoki, Toshio, 3,870,820.
Takahashi, Nobuaki; and Kasuga, Masao, 3,870,971.

Victor, Leslie E. High line towing device. 3,870,280, Cl. 254-134.30R.

Victory, Thomas J. Method of converting one type of brake band to another type. 3,869,785, Cl. 29-401.000.

Vidar Corporation: *See—*
Baichtal, James R.; and McDonald, John C., 3,870,824.
Gayler, Winston D.; and Ahern, James E., 3,870,823.

Vignaud, Jean-Pierre; and Leguy, Bernard, to Regie Nationale des Usines Renault. Reproduction lathe. 3,869,946, Cl. 82-14.00R.

Vigneron, Pierre, to Pont-A-Mousson S. A. Method for making a branch connection under pressure to a pipe and a screwthreaded branch connection for carrying out said method. 3,870,064, Cl. 137-15.000.

Viguier, Leon Fernand, to Laboratories Medicoplast. Apparatus for separating and injecting blood component. 3,870,042, Cl. 128-214.00D.

Virginia Chemicals Inc.: *See—*
Ellis, Leonard C.; and Kise, Mearl A., 3,870,756.

Vockenhuber, Karl: *See—*
Muszumanski, Trude, 3,870,401.

Voegeli, Henry Carl. Coin-operated latch mechanism with coin return means. 3,870,136, Cl. 194-54.000.

Vogel, Roger F.: *See—*
Tabacek, Joseph A.; Taylor, Brian W.; and Vogel, Roger F., 3,870,545.

Volkswagenwerk Aktiengesellschaft: *See—*
Schulz, Waldemar, 3,870,335.

Volokhov, Ivan Ivanovich: *See—*
Rybalko, Alexei Petrovich; Karpekin, Viktor Vladimirovich; Didenko, Nikolai Sidorovich; and Volokhov, Ivan Ivanovich, 3,869,871.

Von Berlichingen, Max. Air supply for pit type refuse incinerator. 3,869,994, Cl. 110-8.00R.

von der Decken, Claus-Benedict: *See—*
Presser, Karl-Heinz; and von der Decken, Claus-Benedict, 3,869,919.

Von Grunberg, Hubertus: *See—*
Belart, Juan; Fink, Werner; Kircher, Dieter; and Von Grunberg, Hubertus, 3,870,377.

Voss, William M.: *See—*
Woods, Thomas H.; and Voss, William M., 3,870,814.

Vosteen, Robert E.; and Williams, Bruce Theodore, to Monroe Electronics, Inc. Electrometer voltage follower having MOSFET input stage. 3,870,968, Cl. 330-207.00P.

Vukotic, Milos: *See—*
Eriksson, Bolik Anders Gottfrid; Johansson, Erik Karl Gustav; and Vukotic, Milos, 3,870,486.

Vyzkumny ustav tvarecich streju a technologie tvareni: *See—*
Holub, Jiri, 3,869,895.

W. M. Cissell Manufacturing Company: *See—*
Bullock, Norman J., 3,869,815.

W. R. Grace and Co.: *See—*
Baird, Richard W.; and Baird, William G., Jr., 3,870,610.
Holdsworth, Robert S.; O'Neill, Gerald Joseph; and Simons, Charles William (said Simons assors. to), 3,870,797.
Palmer, Nigel Innes; and Sugarman, Nathan, 3,870,567.
Schirmer, Henry G., 3,870,609.

Wachter, William J.: *See—*
Apt, Jerome, Jr.; Wachter, William J.; and Rohrer, Wesley M., Jr., 3,870,078.

Wacker-Chemie GmbH: *See—*
Piekarski, Gottfried, 3,870,654.

Wadensten, Theodore S. Noiseless air-actuated turbine-type vibrator. 3,870,282, Cl. 259-1.000.

Wagner, Eugene R., to Dow Chemical Company, The. Process for oxygen-alkylation of sterically hindered phenols. 3,870,744, Cl. 360-465.00F.

Wagner, Richard C., to Hollymatic Corporation. Apparatus for depositing flowable material. 3,870,013, Cl. 118-24.000.

Wagner, Richard C. Shingling apparatus for food items. 3,870,139, Cl. 198-34.000.

Wahlquist, Carl D., to Building Components Research, Inc. Building construction and method. 3,869,841, Cl. 52-745.000.

Wakahara, Shigeo, to Nippon Kogaku K.K. Film speed change-over device in a motion picture projector. 3,870,407, Cl. 352-194.000.

Wakamiya, Kinji; and Kobayashi, Isamu, to Sony Corporation. Semiconductor integrated circuit. 3,871,007, Cl. 357-49.000.

Wakayama Iron Works Ltd.: *See—*
Miyamoto, Tadashi; and Iwahashi, Masaaki, 3,869,882.

Wakefield, David John: *See—*
Gosling, William Robert Frederick; Wakefield, David John; and Long, Terry, 3,870,106.

Walker, Alan J. Current collection means for electric motors. 3,870,914, Cl. 310-219.000.

Walker, Alfred O., to Nalco Chemical Company. Apparatus and method for monitoring the presence of volatile organic lead compounds. 3,870,469, Cl. 23-232.00E.

Walker, David G.; Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Process for the separation of C_4 acetylenic hydrocarbons from gas streams. 3,870,482, Cl. 55-62.000.

Wallace Murray Corporation: *See—*
Crook, James E.; Cutler, John F., Jr.; and Khanna, Jai K., 3,870,029.

Wallick, Seymour Dudley; and Sandler, Joseph Jacob, to Wis-King, Inc. Wall brush. 3,869,750, Cl. 15-322.000.

Walls, Milton A.: *See—*
Dixson, Bruce E.; Hoffman, Marcus I., III; and Walls, Milton A., 3,870,495.

Walter, Arthur A. W.; and Langenbach, Erwin, to Erwin Sick Optik-Elektronik. Light barrier apparatus. 3,870,878, Cl. 250-239.000.

Walters, Rodney P.: *See—*
Johnson, Waldo O.; and Walters, Rodney P., 3,869,839.

Walton, Richard Rhodes; and Munchbach, George Ernest, to said Walton by said Munchbach. Methods of compressively treating flexible sheet materials. 3,869,768, Cl. 26-18.600.

Waltz, Dale M.: *See—*
Klay, William F., 3,869,752.

Ward, John H.; and Spector, George. Adjustable density anti-glare visor for vehicles. 3,870,403, Cl. 350-276.000.

Ware, Bennie R.: *See—*
Flygare, Willis H.; and Ware, Bennie R., 3,870,612.

Warren, Bert; and Evans, George L., to Schering Corporation. Novel diagnostic system for differentiation of enterobacteriaceae. 3,870,601, Cl. 195-103.50R.

Washechek, Delmar: *See—*
Powers, Donald; and Washechek, Delmar, 3,869,823.

Watanabe, Akio; and Murata, Yasuzo, to Pilot Man-Nev-Hitsu Kabushiki Kaisha. Visual recording method and means. 3,870,435, Cl. 117-36.200.

Watanabe, Itaru: *See—*
Tanaka, Kyugo; Oshima, Shozo; and Watanabe, Itaru, 3,870,760.

Watanabe, Masaru; Kobayashi, Kesanao; Misu, Hiroshi; Sato, Akira; and Hasegawa, Eiichi, to Fuji Photo Film Co., Ltd. Photopolymerizable composition. 3,870,524, Cl. 96-115.00P.

Watanabe, Wataru: *See—*
Nara, Hirotoshi; Watanabe, Wataru; Yokota, Tadashi; and Yanagi, Chiak, 3,870,248.

Watermill Engineering Limited: *See—*
Sharp, Douglas Cecil William Thomas, 3,869,969.

Watson, Carlton B., Jr.: *See—*
Lawlor, Robert E.; Watson, Carlton B., Jr.; and McGill, Michael E., 3,870,315.

Watson, Donald W., to Xerox Corporation. Selective transfer of an electrostatic toner image. 3,870,541, Cl. 117-17.500.

Watts, John, to Boeing Company, The. Landing gear and locking apparatus therefor. 3,870,254, Cl. 244-102.0SL.

Waugh, Theodore R.; Smith, Richard C.; Anzel, Sanford H.; and Orofino, Caesar F., to University of California, The Regents of the. Articulated two-part prosthesis replacing the knee joint. 3,869,731, Cl. 3-1.000.

Wean United Inc.: *See—*
Briggs, Albert Theodore, 3,870,243.
Deffenbaugh, James F.; Williams, Arthur L.; and Ellis, Robert S., 3,870,851.

Webb, Oswald; and Pagdin, Brian Colin, to GKN Transmission Limited. Vehicle with differential assembly. 3,869,940, Cl. 74-711.000.

Webber, Robert C. Expansion valve sensor bulb. 3,869,872, Cl. 62-225.000.

Weber, Hans: *See—*
Rodach, Alexander; and Weber, Hans, 3,869,845.

Webster, William C.: *See—*
Minnick, Leonard John; Smith, Charles L.; and Webster, William C., 3,870,535.

Weetall, Howard H., to Corning Glass Works. Method of bonding hydroxyquinoline to an inorganic material. 3,870,543, Cl. 117-54.000.

Weggeland, John H. Picture viewer. 3,869,819, Cl. 40-64.00A.

Weigert, Wolfgang: *See—*
Lussling, Theodor; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,870,746.

Weightman, Robert F.: *See—*
Pearlstein, Fred; and Weightman, Robert F., 3,870,526.

Weiland, Werner, to Rheintechnik Weiland & Kaspar OHG. Obstetric device for animals. 3,870,049, Cl. 128-353.000.

Weiler, Ernest D.: *See—*
Miller, George A.; and Weiler, Ernest D., 3,870,795.

Weiner, Joseph R.: *See—*
Adamski, Joseph A.; Weiner, Joseph R.; and Lavoie, Girard H., 3,870,472.

Weisberg, Alfred M.; and Butler, Florence P., to Technic Inc. Process for producing bright electrodeposits of gold and its alloys. 3,870,619, Cl. 204-43.00G.

Weischedel, Herbert Rudolf; and Westerman, George Raymond, to Bell Telephone Laboratories, Incorporated. Converter circuit with correction circuitry to maintain signal symmetry in the switching devices. 3,870,943, Cl. 321-2.000.

Wemac Company: *See—*
Kallel, Allen, 3,870,275.

Wendler, Norman L.; Taub, David; Slates, Harry L.; and Zelawski, Zbigniew S., to Merck & Co., Inc. Intermediates and process for prostaglandin synthesis. 3,870,747, Cl. 260-468.00G.

Wensch, Alfred: *See—*
Doschko, Werner; Fohlisch, Wolfgang; and Wensch, Alfred, 3,869,853.

Wentzel, Warren W., Jr.; and Harper, Robert A., Jr., to Aluminum Company of America. Integral in-line discharge air gravity conveyor. 3,870,374, Cl. 302-28.000.

Werner, Edward E., to Kimberly-Clark Corporation. Sheet pulp separator and feeder for baled pulp. 3,870,167, Cl. 214-8.5SS.

Werner & Pfleiderer: *See—*
Bausch, Gunther; Millauer, Christian; and Paul, Harald, 3,870,285.

Werner, Udo; Biesen, Kurt; and Sroka, Jurgen, to Bremsky Aktiengesellschaft, Firma. Seat, particularly for automotive vehicles. 3,870,269, Cl. 248-394.000.

Wernsing, Kenneth L. Self-locking winch line hook. 3,870,357, Cl. 294-74.000.

Werych, Ewald R., to Sola Basic Industries, Inc. In-situ molded reinforced furnace panels. 3,870,463, Cl. 432-247.000.

Werych, Ewald R., to Sola Basic Industries, Inc. Electric hot plate heating unit with a ceramic cover. 3,870,861, Cl. 219-459.000.

Wesco Industries, Corporation: *See—*
Schussel, Edward W., 3,870,242.

West, Roland J., to Vaughn Corporation. Ramp for vehicles. 3,870,277, Cl. 254-88.000.

Westerman, George Raymond: *See—*
Weischedel, Herbert Rudolf; and Westerman, George Raymond, 3,870,943.

Westvaco Corporation: *See—*
Falkehag, Sten I.; and Bailey, Carl W., III, 3,870,681.

Wetherby, Robert Earle: *See—*
Mullin, George Cruise; Wetherby, Robert Earle; and Chevalier, Victor Oscar, 3,869,834.

Whalen, Kenneth R.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.

Whall, James M., to Polaroid Corporation. Spread roller system for self developing type photographic apparatus. 3,871,010, Cl. 354-86.000.

Whirlpool Corporation: *See—*
Bashark, Larry Thomas, 3,870,417.
Bond, Ralph W., 3,870,392.
Doner, John T., 3,870,862.
Friesen, Dale M.; and Nordeen, Erwin E., 3,870,491.
Sulcek, Charles E., 3,869,979.

White, Chester A. Multi level holding tank discharge system. 3,869,733, Cl. 4-67.00A.

Whitehead, David Montagu: *See—*
Desty, Denis Henry; Whyman, Barry Herbert Francis; and Whitehead, David Montagu, 3,870,459.

Whitten, Charles M.; and Hagstrom, Robert G. Production of activated char using a moving grate stoker furnace. 3,870,652, Cl. 252-421.000.

Whyman, Barry Herbert Francis: *See—*
Desty, Denis Henry; Whyman, Barry Herbert Francis; and Whitehead, David Montagu, 3,870,459.

Wickum, Jay A.: *See—*
Barrett, Donald Dean; Whalen, Kenneth R.; Nichols, Charles; Knapp, Robert G.; Wickum, Jay A.; and Maust, Daniel A., 3,869,762.

Wielezynski, Leck Godfryd. Process and equipment for the deasphalting of residues from vacuum distillation of petroleum, and application to the remaining of lubricant oil. 3,870,625, Cl. 208-180.000.

Wieser, Louis, to J. Bobst & Fils SA. Feeding device for a carton forming machine. 3,870,140, Cl. 198-190.000.

Wikstrom, Berth Atle: *See—*
Edlund, Lars Anders; and Wikstrom, Berth Atle, 3,870,855.

Wilber, James Albert, to RCA Corporation. Chrominance signal correction. 3,871,020, Cl. 358-8.000.

Wilcox, David L.: *See—*
King, William J.; and Wilcox, David L., 3,871,014.

Wilcox, Milton E., to Motorola, Inc. Noise and overload protection circuit for synchronous demodulators. 3,871,022, Cl. 358-23.000.

Wildman, Claude L.; and Hellmer, George A., to Kummerer, Richard A.; and Besten, Alfred D., part interest to each. Method of making a chain link. 3,869,856, Cl. 59-8.000.

Wildwood Products, Inc.: *See—*
Phillips, David P., 3,870,276.

Wiley, Robert Emerson; and Coniglio, James John, to Acheson Industries, Inc. Ignition cable. 3,870,987, Cl. 338-214.000.

Wilhelm, Donald L.: *See—*
Kryger, Allen C.; Nevin, Charles S.; and Wilhelm, Donald L., 3,870,527.

Wilhelm, Frederick R.; Hastings, Donald R.; and Lyth, William W., to Nordson Corporation. Color change of electrostatic spray apparatus. 3,870,233, Cl. 239-15.000.

Wiljes, Juergen: *See—*
Biegler, Hanns; and Wiljes, Juergen, 3,870,532.

Wilkerson, Edward D. Quick-check aligner. 3,869,798, Cl. 33-264.000.

Wilkerson, Edward D. Engine ventilation of boat bilges. 3,870,008, Cl. 114-211.000.

Willemse, Adrianus H.: *See—*
Kratcoski, Francis L.; and Willemse, Adrianus H., 3,870,017.

Williams, Arthur L.: *See—*
Deffenbaugh, James F.; Williams, Arthur L.; and Ellis, Robert S., 3,870,851.

Williams, Bruce Theodore: *See—*
Vosteen, Robert E.; and Williams, Bruce Theodore, 3,870,968.

Williams, Dick W.: *See—*
Darrah, John W., III; and Williams, Dick W., 3,869,843.

Williams, Paul, to Infra Systems, Inc. Apparatus for negating effect of scattered signals upon accuracy of dual-beam infrared measurements. 3,870,884, Cl. 250-339.000.

Willich, Jean Herbert, to August Bilstein, Firma. Fluid springs, particularly for vehicles. 3,870,286, Cl. 267-64.00R.

Willis, Peter Charles: *See*—
Bartlett, Christopher Leslie; and Willis, Peter Charles, 3,869,800.

Wilson, Bradford W. Body guide for athletic club swinging training. 3,870,317, Cl. 273-188.00R.

Wilson, Carl D.: *See*—
Finke, Harry P.; Carr, Hugh B.; and Wilson, Carl D., 3,870,079.

Wilson, David G.; Hanson, Brian D.; and Malarkey, John M. Variable-leverage brakes for bicycles and the like. 3,870,127, Cl. 188-24.000.

Wilson, Fred V.; and Leblanc, Henry J., Sr., to Standard Brass and Manufacturing Company. Sacrificial anode. 3,870,615, Cl. 204-197.000.

Wilson, Harold R.; and Kamerling, Marc A., to Donnelley Mirrors, Inc. Mirror actuator and support means therefor. 3,870,404, Cl. 350-281.000.

Wilson, Harry Brian: *See*—
Robinson, Michael; Wilson, Harry Brian; and Gray, David Antony, 3,870,506.

Wilson, Rolland E. Insecticide applicator for livestock. 3,870,023, Cl. 119-159.000.

Wilt, Charles R., Jr., to Salem Corporation. Mobile rotary type continuous coke quencher. 3,870,604, Cl. 202-227.000.

Winberg, Douglas F.; and Dyer, Norman D., to Dresser Industries, Inc. Tunneling shield. 3,870,368, Cl. 299-31.000.

Winberg, Douglas F.; and Dyer, Norman D., to Dresser Industries, Inc. Universal saddle mounting for fixed and rolling cutters. 3,870,370, Cl. 299-91.000.

Winkler, Josef: *See*—
Oesterhelt, Gerhard; Winkler, Josef; Falkenberg, Dieter; and de Bucs, Eugen Szabo, 3,870,568.

Winter, Charles M. Tow hitch for fifth wheel type trailer. 3,870,340, Cl. 280-415.00B.

Winter, Edwin M.: *See*—
Lin, Paul T. C.; and Winter, Edwin M., 3,871,015.

Wis-King, Inc.: *See*—
Wallick, Seymour Dudley; and Sandler, Joseph Jacob, 3,869,750.

Wise, Walter G. Flame treating of paperboard and method therefor. 3,870,461, Cl. 432-11.000.

Wisseman, Leo L., to Motorola, Inc. Method and apparatus for adjustment of offset voltage of a differential amplifier. 3,870,967, Cl. 330-30.00D.

Wisseroth, Karl. Homopolymerization or copolymerization of ethylene. 3,870,693, Cl. 260-94.90D.

Witman, Jack H., to Armstrong Cork Company. Dimensionally stable, flexible plastic surface coverings. 3,870,591, Cl. 161-119.000.

Witt, Harro; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Preparation of cross-linked particles of polyurethane or polyurea containing ionic groups. 3,870,684, Cl. 260-75.0NH.

Witte, Waldemar. Electrical appliance with housing of plastic foam material. 3,870,843, Cl. 200-302.000.

Witteborg, E. F., Jr. Fishing spool. 3,870,245, Cl. 242-167.000.

Woehrle, Richard E.: *See*—
Seyb, Edgar J., Jr.; and Woehrle, Richard E., 3,870,618.

Wolf-Gerate GmbH: *See*—
Orth, Gunther, 3,870,147.

Wolff, Robert A., to Admiral Corporation. Sound muting circuit with automatic sound return. 3,870,956, Cl. 325-478.000.

Wolk, Ronald H.: *See*—
Johnson, Axel R.; Wolk, Ronald H.; and Alpert, Seymour B., 3,870,623.

Wollmann, Klaus; Ploger, Walter; and Wopms, Karl-Heinz, to Henkel & Cie GmbH. Process for the production of aminomethanediphosphonic acid and its salts. 3,870,750, Cl. 260-502.500.

Wolowodiuk, Walter, to United States of America, Atomic Energy Commission. Seal assembly. 3,870,099, Cl. 165-82.000.

Woltjen, Duane W., to UMC Industries, Inc. Flexible belt carrier mechanism. 3,870,142, Cl. 198-193.000.

Wombacher, Peter: *See*—
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,915.
Kussel, Eckart; Haubold, Heinz-Gunther; and Wombacher, Peter, 3,870,916.

Woodall, Phillip J.: *See*—
McCormick, Joseph L.; McMullen, Charles G.; and Woodall, Phillip J., 3,870,994.

Woods, Thomas H.; and Voss, William M., to Mosler Safe Company, The. Image positioning apparatus and method. 3,870,814, Cl. 178-7.200.

Wootton, Thomas S., to Baldwin Electronics, Inc. Dual frequency transmitter system. 3,870,959, Cl. 325-156.000.

Wopms, Karl-Heinz: *See*—
Wollmann, Klaus; Ploger, Walter; and Wopms, Karl-Heinz, 3,870,750.

Workman, Gerald B.; and Deardurff, Lawrence R., to Owens-Corning Fiberglas Corporation. Starch coated fibers for embedding in resin matrix forming materials and composites so formed. 3,870,547, Cl. 117-72.000.

Wright, Charles H.: *See*—
Hallford, Ben R.; and Wright, Charles H., 3,870,960.

Wright, Craig Nellis; and Richards, Kenneth Julian, to Kennecott Copper Corporation. Process of recovering rhenium values from complex industrial solutions. 3,870,779, Cl. 423-50.000.

Wright, Everald V., to Dravo Corporation. Mooring system for floating structures. 3,870,010, Cl. 114-230.000.

Wright, Jeffrey L.: *See*—
Arakelian, Hagop; and Wright, Jeffrey L., 3,869,812.

Wurst, Bert, to Robert Bosch GmbH. Auxiliary brake control for automotive vehicles particularly having automatic transmissions. 3,870,119, Cl. 180-77.00R.

Wyant, Jon Richard, to Mead Corporation, The. Double wing pocket portfolio and file folder. 3,870,223, Cl. 229-72.000.

Wynn, Robert W.: *See*—
Randall, David I.; and Wynn, Robert W., 3,870,772.

Wyss, C. Robert: *See*—
Siems, Ruth M.; Capossela, Anthony C., Jr.; Halligan, John F.; and Wyss, C. Robert, 3,870,803.

Xerox Corporation: *See*—
Burns, James W., 3,870,921.
Carr, George P.; and Mason, James A., Jr., 3,869,896.
Kaupp, Norbett H., 3,870,515.
Kukucka, William P., 3,870,295.
Mason, Peter John, 3,870,816.
Oagley, Jack R., 3,870,883.
Sato, Masamichi; and Tezuka, Shigeru, 3,870,514.
Scaletta, Joseph Louis, 3,869,910.
Smith, Michael; Hackett, Charles F.; and Radler, Richard W., 3,870,516.
Taylor, Leo Ottis, 3,870,903.
Valentine, Charles G., 3,869,811.
Watson, Donald W., 3,870,541.

Yagihara, Tomio: *See*—
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.

Yakovlev, Vladimir Vasilievich: *See*—
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Yakovleva, Ljudmila Alexandrovna: *See*—
Alexceva, Alexandra Konstantinovna; Yakovleva, Ljudmila Alexandrovna; Vasilieva, Irina Nikolaevna; Andzhaparidze, Otar Georgievich; and Alexandrova, Angelina Nikolaevna, 3,870,598.

Yakubik, Charles F.: *See*—
Lydle, John E.; and Yakubik, Charles F., 3,870,032.

Yakushev, Dmitry Petrovich: *See*—
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Yakushiji, Masatoshi: *See*—
Hirono, Yoshihiko; Ogino, Hatsuo; Nishikawa, Seiichi; Miyazaki, Koshin; Yakushiji, Masatoshi; and Yagihara, Tomio, 3,870,501.

Yamada, Hiroshi; and Kojima, Kenji, to Kabushiki Kaisha Ricoh. Automatic cartridge tape draw-out device. 3,870,246, Cl. 242-192.000.

Yamada, Nobuo: *See*—
Shiraishi, Hiroo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,870,485.

Yamaguchi, Mitsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Recorder. 3,869,955, Cl. 84-380.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Hase, Hideonori, 3,870,115.

Yamamoto, Akira: *See*—
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,870,702.

Yamamoto, Katsuro, to Bridgestone Liquefield Gas Company, Ltd. Method of constructing a heat insulating wall of foamed sulfur. 3,870,588, Cl. 264-42.000.

Yamamoto, Kenzo; Matsuoka, Seiichi; and Shioda, Toshio, to Japan Gasoline Co., Ltd. Process for manufacturing gases rich in methane. 3,870,738, Cl. 260-449.00S.

Yamamoto, Kiyoshi: *See*—
Yamashita, Gentaro; and Yamamoto, Kiyoshi, 3,870,754.

Yamamoto, Nobuo; Kawaguchi, Hideo; and Furukawa, Katsuharu, to Fuji Photo Film Co., Ltd. Process for producing photographic film having a magnetizable layer thereon and such a photographic film. 3,870,525, Cl. 96-39.000.

Yamashita, Gentaro; and Yamamoto, Kiyoshi, to Teijin Limited. Process for the preparation of 2,6-naphthalenedicarboxylic acid. 3,870,754, Cl. 260-524.00R.

Yamashita, Nobuo; and Fujii, Toru, to Olympus Optical Company Limited. Wide-angle lens system with movable lens for correcting short distance photographic faculty arranged near diaphragm. 3,870,400, Cl. 350-214.000.

Yanagi, Chiak: *See*—
Nara, Hirotoshi; Watanabe, Wataru; Yokota, Tadashi; and Yanagi, Chiak, 3,870,248.

Yanagisawa, Takeshi: *See*—
Nakamoto, Soichi; and Yanagisawa, Takeshi, 3,870,418.

Yanai, Noriyoshi: *See—*
Kamo, Seiichi; Yanai, Noriyoshi; and Osako, Naoto, 3,870,755.

Yancey, Raymond W. Article of manufacture with twisted web. 3,869,778, Cl. 29-191.000.

Yardney International Corp.: *See—*
Berchielli, Aldo S., 3,869,987.

Yaroshenko, Jury Feodosievich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Rogozhin, Sergei Vasilievich; Misjurev, Vladimir Ivanovich; Borisoglebsky, Alexei Gennadievich; Yaroshenko, Jury Feodosievich; Gonsales, Rodriges Sesar; Kovalev, Petr Vasilievich; and Myakin, Valery Alexandrovich, 3,869,976.

Yeaple Corporation: *See—*
Yeaple, Ronald N., 3,870,834.

Yeaple, Ronald N., to Yeaple Corporation. Personal stereophonic speaker system. 3,870,834, Cl. 179-146.00H.

Yeda Research & Development Co. Ltd.: *See—*
Frei, Ephraim H.; Yerushalmi, Shmuel; and Benmair, Yusuf, 3,870,645.

Yerushalmi, Shmuel: *See—*
Frei, Ephraim H.; Yerushalmi, Shmuel; and Benmair, Yusuf, 3,870,645.

Yodogawa Steel Works, Limited: *See—*
Kudo, Shinji, 3,870,594.

Yokogawa Electric Works, Ltd.: *See—*
Miyauchi, Rin-Ichi; Saito, Bunjiro; and Ikeda, Kyoichi, 3,869,920.

Yokota, Tadashi: *See—*
Nara, Hirotoshi; Watanabe, Wataru; Yokota, Tadashi; and Yanagi, Chiak, 3,870,248.

Yonehara, Toshimitsu: *See—*
Shibano, Takashi; Hirakawa, Koichi; and Yonehara, Toshimitsu, 3,870,982.

Yoneyama, Ken: *See—*
Iwami, Ichiro; Matsunaga, Tsutomu; and Yoneyama, Ken, 3,870,551.

Yoon, In Bae. Device for sterilizing the human female or male by ligation. 3,870,048, Cl. 128-326.000.

Yoshida, Fumitake; and Ohshima, Norio, to Fumitake Yoshida. Bubble-type blood oxygenator with baffles. 3,870,470, Cl. 23-258.500.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Fukuroi, Takeo, 3,869,765.

Yoshida, Mikihiko; and Yuen, Shokichi, to Hayashibara Company. Nitrogen containing amylose derivatives. 3,870,704, Cl. 260-233.30R.

Yoshida, Okio: *See—*
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Aihara, Satoshi, 3,870,558.

Yoshida, Shuji; and Iguchi, Tateo, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin-graft-polyblend compositions. 3,870,769, Cl. 260-876.00R.

Yoshimoto, Katsutoshi: *See—*
Nakamura, Tsutomu; Itoh, Kensuke; Murata, Hajime; Ishikawa, Makoto; Furuichi, Eiichi; Arakawa, Yasuhiro; Taneya, Shinichi; Motomura, Hiroji; Yoshimoto, Katsutoshi; and Tomokawa, Hisao, 3,870,613.

Yoshizawa, Kenzo. Lock. 3,869,888, Cl. 70-355.000.

Yotumoto, Yoshiharu: *See—*
Ogawa, Kazuo; Machii, Tetsuo; Sawano, Takahiro; Kubota, Katuhiko; and Yotumoto, Yoshiharu, 3,870,944.

Younger, Dwen R. Straddle trailer hitch. 3,870,341, Cl. 280-423.00R.

Youssef, Kamal Abdou. Selective and enrichment medium for the isolation identification and propagation of yeasts and fungi. 3,870,600, Cl. 195-81.000.

Yuen, Shokichi: *See—*
Yoshida, Mikihiko; and Yuen, Shokichi, 3,870,704.

Yukuta, Toshio: *See—*
Onishi, Akira; Yukuta, Toshio; Iseda, Yutaka; and Iwami, Kouichi, 3,870,620.

Yungblut, Charles W.; and Hill, Robert D., Jr., to Spectrol Electronics Corporation. Method of manufacturing variable resistance device. 3,869,789, Cl. 29-610.000.

Zahnradfabrik Friedrechshafen AG.: *See—*
Brugger, Hans; and Mallener, Helmut, 3,870,572.

Zeiss-Stiftung, Carl: *See—*
Neuer, Harald; Szenger, Franz; Herzog, Klaus; and Neumann, Joachim, 3,869,799.

Zeit, Harry. Surface mounted lock unit for sliding doors. 3,869,887, Cl. 70-100.000.

Zeitter, Charles R., to Packaging Corporation of America. Folding carton. 3,870,221, Cl. 229-16.00D.

Zelawski, Zbigniew S.: *See—*
Wendler, Norman L.; Taub, David; Slates, Harry L.; and Zelawski, Zbigniew S., 3,870,747.

Zelikman, Grigory Avrumovich: *See—*
Isitovsky, Ilya Leonidovich; and Zelikman, Grigory Avrumovich, 3,870,576.

Zellweger AG: *See—*
Ploeckl, Johann, 3,870,394.

Zerver, Hermann Jochen. Socket wrench head for spark plugs. 3,869,945, Cl. 81-125.000.

Zimmer, Clarence L.: *See—*
Vanderbilt, Vern C., Jr.; Zimmer, Clarence L.; and Van Ostrand, William F., 3,870,972.

Zimmerman, Dallas D.: *See—*
Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D., 3,870,682.

Zimmerman, Emil F. Lifting mechanism for front end loader. 3,870,171, Cl. 214-131.00R.

Zlatareff, Vassil: *See—*
Glaser, Heinz; and Zlatareff, Vassil, 3,870,539.

Zuber, Bretislav Paul: *See—*
Iyengar, Rama; Zuber, Bretislav Paul; and Boucher, Jean Raymond, 3,869,902.

Zubov, Ivan Petrovich: *See—*
Semenov, Nikolai Nikolaevich; Gussak, Lev Abramovich; Bobolev, Vasily Konstantinovich; Unxov, Evgeny Pavlovich; Astafiev, Anatoly Alexandrovich; Khazanov, Mikhail Semenovich; Moroz, Vitaly Iosifovich; Severov, Mark Alexandrovich; Kuleshov, Roman Stepanovich; Levitsky, Vladimir Konstantinovich; Yakushev, Dmitry Petrovich; Rudkov, Gennady Demyanovich; Zubov, Ivan Petrovich; Afanasiev, Viktor Vasilievich; Yakovlev, Vladimir Vasilievich; Baranovsky, Leonid Sememovich; and Koroleva, Margarita Borisovna, 3,870,462.

Zuercher, Edward A., Jr., to General Electric Company. Hermetically sealed compressor suction tube assembly. 3,870,440, Cl. 418-248.000.

Zuideveld, Reinder, to Koninklijke Emballage Industrie Van Leer B.V. Container with a frangible lid and a tool for opening said container. 3,870,189, Cl. 220-277.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MARCH, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asche, Henning, to Ciba-Geigy AG. Toothpaste. Re. 28,363, 3–11–75, Cl. 424—57.

Calvin, John N., to Combustion Engineering, Inc. Flow deflector for nuclear fuel element assemblies. Re. 28,362, 3–11–75, Cl. 176—78.

Ciba-Geigy AG: *See*—
Asche, Henning. Re. 28,363.

Combustion Engineering, Inc.: *See*—
Calvin, John N. Re. 28,362.

Cosden Oil & Chemical Co.: *See*—
Hahn, Granville J. Re. 28,361.

Hahn, Granville J., to Cosden Oil & Chemical Co. Polymer pigmentation. Re. 28,361, 3–11–75, Cl. 117—16.

LIST OF PLANT PATENTEES

Cobia, B. L., Inc.: *See*—
Cobia, Barnell L. 3,688.
Cobia, Barnell L. 3,689.
Cobia, Barnell L. 3,690.

Cobia, Barnell L., to B. L. Cobia, Inc. Cactaceae plant. 3,688, 3–11–75, Cl. 88.

Cobia, Barnell L., to B. L. Cobia, Inc. Bromeliaceae plant-cryptanthus bivittatus minor (cv) pink starlight. 3,689, 3–11–75, Cl. 88.

Cobia, Barnell L., to B. L. Cobia, Inc. Cactaceae plant. 3,690, 3–11–75, Cl. 88.

LIST OF DESIGN PATENTEES

Achenbach, Walter B., to Owens-Illinois, Inc. Goblet or similar article. 234,448, 3–11–75, Cl. D7—13.

Ahlrot, Ake. Duct coupling. 234,462, 3–11–75, Cl. D23—43.

Ahlrot, Ake. Duct coupling. 234,463, 3–11–75, Cl. D23—43.

American Standard Inc.: *See*—
Stairs, Henry M., Jr. 234,464.

Blake, William A. Set of brackets for paper towel packages or the like. 234,455, 3–11–75, Cl. D8—233.

Bloom, Joseph C. Gas meter valve wrench. 234,451, 3–11–75, Cl. D8—17.

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Fosher, Donald H., and Brace. 234,472.

Caldwell, Russell F., and D. E. Laughead. Fishing lure. 234,460, 3–11–75, Cl. D22—27.

Carre, Alain, to Societe le Foyer. Pen. 234,471, 3–11–75, Cl. D74—17.

Dearth, Timothy E., R. H. Guernsey, and R. R. Hydell, to Eli Lilly & Co. Container for food products. 234,456, 3–11–75, Cl. D9—182.

Delgrosso, Elaine V. Butterfly bow decoration. 234,467, 3–11–75, Cl. D29—1.

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Koch, Walter L., and Franklin. 234,468.

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Greenblatt, Irwin, and N. A. Marino, to Sears, Roebuck & Co. Brassiere pad. 234,445, 3–11–75, Cl. D2—24.

Guernsey, Richard H.: *See*—
Dearth, Timothy E., Guernsey, and Hydell. 234,456.

Haygeman, Robert M. Plastics injection molder. 234,470, 3–11–75, Cl. D55—1.

Hydell, Ronald R.: *See*—
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Laughead, Dannie E.: *See*—
Caldwell, Russell F., and Laughead. 234,460.

Lichtman, Philip R. Hand gun. 234,458, 3–11–75, Cl. D22—1.

Lichtman, Philip R. Hand gun. 234,459, 3–11–75, Cl. D22—1.

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Dearth, Timothy E., Guernsey, and Hydell. 234,456.

Lindsay, John. Navigation instrument. 234,469, 3–11–75, Cl. D52—6.

Loyd's Industri A/S: *See*—
Tolfsen, Ulf. 234,454.

Marino, Nicholas A.: *See*—
Greenblatt, Irwin, and Marino. 234,444.
Greenblatt, Irwin, and Marino. 234,445.

Mayer, Klaus: *See*—
Stuetzer, Franz, and Mayer. 234,449.

Miyake, Takao: *See*—
Suganoya, Yoshio, and Miyake. 234,450.

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Achenbach, Walter B. 234,448.

Peripheral Graphics Inc.: *See*—
Ginsberg, Jacob J. 234,453.

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Rowenta-Werke GmbH: *See*—
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Kitai, Isao. 234,466.
Suganoya, Yoshio, and Miyake. 234,450.

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Carre, Alain. 234,471.

Stairs, Henry M., Jr., to American Standard Inc. Double bowl sink. 234,464, 3–11–74, Cl. D23—62.

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CLASSIFICATION OF PATENTS

ISSUED MARCH 11, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

164 3,869,726
175 3,869,727
221 3,869,728

CLASS 3

1 3,869,729
3,869,730
3,869,731

CLASS 4

3,869,732
67A 3,869,733
146 3,869,734
3,869,735
172.19 3,869,736
213 3,869,737

CLASS 5

200R 3,869,738
353 3,869,739
354 3,869,740

CLASS 7

17 3,869,741

CLASS 8

94.26 3,870,464

CLASS 9

1R 3,869,742
2C 3,869,743
340 3,869,744

CLASS 12

145 3,869,745

CLASS 15

29 3,869,746
104.1R 3,869,747
172 3,869,748
302 3,869,749
322 3,869,750
334 3,869,751

CLASS 16

128 3,869,752
171 3,869,753
197 3,869,754

CLASS 17

25 3,869,755
32 3,869,757
49 3,869,756

CLASS 19

153 3,869,758
293 3,869,759

CLASS 23

230A 3,870,465
230R 3,870,466
3,870,467
232E 3,870,469
232R 3,870,468
258.5 3,870,470
267E 3,870,471
273SP 3,870,472
3,870,473
277C 3,870,474
285 3,870,475
289 3,870,476
301SP 3,870,477

CLASS 24

73VA 3,869,761
73 3,869,760
81AG 3,869,762
198 3,869,763
204 3,869,764
205.11F 3,869,765
216 3,869,766
243CC 3,869,767

CLASS 26

18.6 3,869,768

CLASS 28

21 3,869,769
51 3,869,770

CLASS 29

2.1 3,870,478
25.13 3,869,772
78 3,869,773
116AD 3,869,774
156.8R 3,869,775
157A 3,869,776
183 3,869,777
191 3,869,778
194 3,869,779
200D 3,869,780
203DT 3,869,781
203B 3,869,782
244 3,869,783
272 3,869,784
401 3,869,785
571 3,869,786
577 3,869,787
597 3,869,788
610 3,869,789

CLASS 30

90 3,869,790
90.1 3,869,791
254 3,869,792
262 3,869,793
278 3,869,794
388 3,869,795

CLASS 32

26 3,869,796
40R 3,869,797

CLASS 33

174L 3,869,799
3,869,800
3,869,802
174R 3,869,801
181AT 3,869,803
264 3,869,798
288 3,869,804
338 3,869,805
348 3,869,806

CLASS 34

33 3,869,807
124 3,869,808
174 3,869,809

CLASS 35

9C 3,869,810
19A 3,869,811
22R 3,869,812
37 3,869,813

CLASS 37

116 3,869,814

CLASS 38

77.6 3,869,815
77.83 3,869,816
102.4 3,869,817

CLASS 40

31 3,869,818
64A 3,869,819
159 3,869,820

CLASS 43

3 3,869,823
42.49 3,869,821
53.5 3,869,822

CLASS 46

17 3,869,824
219 3,869,825

CLASS 47

17 3,869,826
3,869,827
34.11 3,869,828
39 3,869,829

CLASS 48

71 3,870,480
213 3,870,481

CLASS 51

8R 3,869,830
75 3,869,831
170PT 3,869,832
295 3,869,834
334 3,869,833

CLASS 52

9 3,869,835
23 3,869,836
75 3,869,837
76 3,869,838
204 3,869,839
211 3,869,840
745 3,869,841

CLASS 53

14 3,869,842
26 3,869,843
30 3,869,844
137 3,869,845
182 3,869,846

CLASS 55

62 3,870,482
192 3,870,483
229 3,870,484
257 3,870,485
276 3,870,486
314 3,870,489
355 3,870,490
376 3,870,491
387 3,870,492
391 3,870,493
436 3,870,487
440 3,870,488
443 3,870,494
489 3,870,495

CLASS 56

220 3,869,847
295 3,869,848
343 3,869,849

CLASS 57

24 3,869,850
58.89 3,869,851
59 3,869,852
77.4 3,869,853

CLASS 58

33 3,869,854
57.5 3,869,855

CLASS 59

8 3,869,856

CLASS 60

39.15 3,869,862
39.18R 3,869,857
39.19 3,869,863
39.65 3,869,864
39.66 3,869,865
290 3,869,858
305 3,869,859
371 3,869,860
413 3,869,861
607 3,869,866

CLASS 61

41A 3,869,867
49 3,869,868
53.64 3,869,869

CLASS 62

114 3,869,870
178 3,869,871
225 3,869,872
275 3,869,873
278 3,869,874
354 3,869,875
376 3,869,876

CLASS 64

2R 3,869,877
8 3,869,878

CLASS 65

22 3,870,496
32 3,870,497
106 3,870,498
156 3,870,499
273 3,870,500

CLASS 66

19 3,869,879
64 3,869,881

CLASS 68

5C 3,869,882
58 3,869,883
258 3,869,884

CLASS 70

93 3,869,886
100 3,869,887
315 3,869,885
355 3,869,888
419 3,869,889
432 3,869,901
451 3,869,890

CLASS 71

78 3,870,501
92 3,870,502
106 3,870,503
120 3,870,504
121 3,870,505

CLASS 72

8 3,869,891
9 3,869,892
39 3,869,893
42 3,869,894
52 3,869,902
107 3,869,895
108 3,869,896
125 3,869,897
239 3,869,898
304 3,869,917
366 3,869,899
384 3,869,900

CLASS 73

61.4 3,869,903
67.5H 3,869,904
119R 3,869,905
141A 3,869,906
146 3,869,907
146.2 3,869,908
147 3,869,909
150R 3,869,910
3,869,912
170A 3,869,911
189 3,869,913
190R 3,869,914
194A 3,869,915
300 3,869,916
339R 3,869,918
358 3,869,919
398R 3,869,920
421B 3,869,921
438 3,869,922

CLASS 74

13 3,869,923
24 3,869,924
25 3,869,925
3,869,926
44 3,869,927
88 3,869,928
112 3,869,929
128 3,869,930
230.17R 3,869,932
230.3 3,869,931
234 3,869,933
242.12 3,869,934
322 3,869,935
459 3,869,936
482 3,869,937
567 3,869,938
687 3,869,939
711 3,869,940

CLASS 75

1 3,870,506
4 3,870,507
10 3,870,508
44S 3,870,509
61 3,870,510
68R 3,870,511
130R 3,870,512
175A 3,870,513

CLASS 81

9.3 3,869,944
52.5 3,869,941
54 3,869,942
90A 3,869,943
125 3,869,945

CLASS 82

14R 3,869,946
19 3,869,947

CLASS 83

286 3,869,948
320 3,869,949
341 3,869,950
745 3,869,951

CLASS 84

1.16 3,869,952
201 3,869,953
291 3,869,954
380 3,869,955

CLASS 85

37 3,869,956
49 3,869,957
80 3,869,958
83 3,869,959

CLASS 89

33CA 3,869,960
191A 3,869,961

CLASS 91

46 3,869,962

CLASS 92

86 3,869,963

CLASS 93

54R 3,869,966
61A 3,869,964
3,869,965

CLASS 96

1LY 3,870,514
1.4 3,870,515
1.5 3,870,516
3,870,517
27R 3,870,518
29L 3,870,479
39 3,870,525
51 3,870,519
60R 3,870,520
67 3,870,521
107 3,870,522
114.1 3,870,523
115P 3,870,524

CLASS 98

61 3,869,967

CLASS 99

280 3,869,968
327 3,869,969
329R 3,869,970
353 3,869,971
410 3,869,972
426 3,869,973
450.2 3,869,975
484 3,869,976
547 3,869,974
640 3,869,977

CLASS 100

53 3,869,978
218 3,869,979

CLASS 101

91 3,869,981
3,869,986
93.21 3,869,980
96 3,869,982
137 3,869,983
349 3,869,984
415.1 3,869,985

CLASS 102

37.4 3,869,987

CLASS 104

11 3,869,988
94 3,869,989
130 3,869,990

CLASS 105

368R 3,869,991

CLASS 106

1 3,870,526
2 3,870,527
22 3,870,528
38.3 3,870,529
50 3,870,530
52 3,870,531
74 3,870,532
90 3,870,533
100 3,870,534
118 3,870,535
146 3,870,536
162 3,870,537
315 3,870,538

CLASS 108

60 3,869,992
101 3,869,993

CLASS 110

8R 3,869,994
18C 3,869,995
99R 3,869,996

CLASS 112

121.12 3,869,997
121.15 3,869,998
121.26 3,869,999
262 3,870,000

CLASS 113

121C 3,870,001

CLASS 114

.5T 3,870,003
39 3,870,004
66.5R 3,870,005
121 3,870,006
160 3,870,007
211 3,870,008
222 3,870,009
230 3,870,010

CLASS 115

.5A 3,870,011

CLASS 116

70 3,870,012

CLASS 117

3.1 3,870,539
16 Re.28,361
3,870,540
17.5 3,870,541
33.3 3,870,542
36.2 3,870,435
54 3,870,543
60 3,870,544
71R 3,870,545
72 3,870,546
3,870,547
3,870,548
73 3,870,549
84 3,870,550
115 3,870,551
122PF 3,870,552
123A 3,870,553
138 3,870,554
138.8F 3,870,555
141 3,870,556
161R 3,870,557
201 3,870,558
3,870,559

CLASS 118

24 3,870,013
52 3,870,014
63 3,870,015
309 3,870,016
637 3,870,017

CLASS 119

3 3,870,018
4 3,870,019
3,870,020
14.13 3,870,021
75 3,870,022
159 3,870,023

CLASS 123

90.41 3,870,024
119CD 3,870,029
139AF 3,870,025
148E 3,870,028
148R 3,870,026
3,870,027

CLASS 125

11TP 3,870,030

CLASS 126

39J 3,870,031
91R 3,870,052
202 3,870,032
360R 3,870,033

CLASS 128

2.05T 3,870,035
2.1Z 3,870,034
6 3,870,036
10 3,870,037
28 3,870,038
66 3,870,039
3,870,040
156 3,870,041
188 3,869,771
214D 3,870,042
214R 3,870,043
220 3,870,044
229 3,870,045
266 3,870,046
303.14 3,870,047
326 3,870,048
353 3,870,049
419PG 3,870,050
422 3,870,051

CLASS 131
121 3,870,053
140C 3,870,054

CLASS 132
10 3,870,055
11A 3,870,056
39 3,870,057
73 3,870,058
92A 3,870,059

CLASS 134
2 3,870,560
3 3,870,060

CLASS 135
5A 3,870,061
20M 3,870,062

CLASS 136
6LN 3,870,561
24 3,870,562
26 3,870,563
30 3,870,564
86A 3,870,565
111 3,870,566
148 3,870,567
212 3,870,568

CLASS 137
13 3,870,063
15 3,870,064
93 3,870,065
199 3,870,066
209 3,870,069
242 3,870,067
268 3,870,068
512 3,870,070
527 3,870,071
557 3,870,072
596.16 3,870,073
3,870,074
606 3,870,075
607 3,870,076
614.11 3,870,077
625.48 3,870,078
630.14 3,870,079
636.4 3,870,080

CLASS 138
38 3,870,081
40 3,870,082
45 3,870,083
89 3,870,084
93 3,870,085
172 3,870,086

CLASS 139
33 3,870,087
122R 3,870,088

CLASS 141
44 3,870,089

CLASS 144
249R 3,870,090

CLASS 145
29R 3,870,091

CLASS 148
6 3,870,569
9.5 3,870,570
3,870,571
16.5 3,870,572
22 3,870,573
122 3,870,574
171 3,870,575
188 3,870,576

CLASS 149
2 3,870,577
19.4 3,870,578

CLASS 151
14R 3,870,092

CLASS 152
213 3,870,093
243 3,870,094
353C 3,870,095

CLASS 156
174 3,870,579
181 3,870,580
192 3,870,581
306 3,870,582
500 3,870,583
505 3,870,584

CLASS 159
4A 3,870,585

CLASS 160
305 3,870,096

CLASS 161
30 3,870,586
37 3,870,587
47 3,870,589
92 3,870,590
119 3,870,591
148 3,870,592
159 3,870,593
165 3,870,594
166 3,870,595

CLASS 162
157C 3,870,596
352 3,870,597

CLASS 164
4 3,870,097

CLASS 165
82 3,870,099
89 3,870,100

CLASS 166
.5 3,870,101
55.1 3,870,098
72 3,870,102
224A 3,870,104

CLASS 169
33 3,870,105

CLASS 172
239 3,870,106
413 3,870,107
722 3,870,108

CLASS 173
38 3,870,109
100 3,870,103
163 3,870,110

CLASS 174
42 3,870,815

CLASS 175
11 3,870,111
93 3,870,112
96 3,870,113
258 3,870,114

CLASS 176
78 Re.28,362

CLASS 178
7.2 3,870,814
7.6 3,870,816

CLASS 179
1CN 3,870,819
1DM 3,870,820
1SA 3,870,817
1SM 3,870,818
2DP 3,870,821
4 3,870,822
7MM 3,870,823
7R 3,870,824
15AL 3,870,825
15AP 3,870,827
15BY 3,870,826
3,870,828
30 3,870,829
90CS 3,870,830
99 3,870,831
100.4R 3,870,835
107E 3,870,832
115.5VC 3,870,833
146H 3,870,834
175.2B 3,870,837
175.3R 3,870,836
175.31R 3,870,838

CLASS 180
5R 3,870,115
54R 3,870,116
64R 3,870,117
75 3,870,118
77R 3,870,119
82C 3,870,120
117 3,870,121

CLASS 182
36 3,870,122
136 3,870,123
178 3,870,124

CLASS 184
15R 3,870,125

CLASS 187
8.52 3,870,126

CLASS 188
24 3,870,127
112 3,870,128
134 3,870,129
288 3,870,130
325 3,870,131

CLASS 190
52 3,870,132

CLASS 191
12.2R 3,870,133

CLASS 192
6A 3,870,134

CLASS 194
4 3,870,135
54 3,870,136
100A 3,870,137

CLASS 195
1.5 3,870,598
2 3,870,599
81 3,870,600
103.5R 3,870,601
139 3,870,602

CLASS 197
17 3,870,138

CLASS 198
34 3,870,139
190 3,870,140
193 3,870,141
3,870,142
280 3,870,143

CLASS 200
5A 3,870,839
3,870,840
44 3,870,842
84R 3,870,844
144B 3,870,845
161 3,870,846
302 3,870,843

CLASS 202
227 3,870,604
234 3,870,605

CLASS 203
5 3,870,606

CLASS 204
15 3,870,607
28 3,870,618
43G 3,870,619
58 3,870,608
159.23 3,870,620
160.1 3,870,609
165 3,870,610
168 3,870,611
180P 3,870,613
180R 3,870,612
181 3,870,614
197 3,870,615
230 3,870,616
301 3,870,617

CLASS 206
45.14 3,870,144
84 3,870,145
3,870,146
222 3,870,147
372 3,870,148
379 3,870,149
438 3,870,150
507 3,870,151
523 3,870,152

CLASS 208
8 3,870,621
93 3,870,622
108 3,870,623
143 3,870,624
180 3,870,625
216 3,870,626

CLASS 209
3 3,870,627
90 3,870,628
111.8 3,870,629
403 3,870,630

CLASS 210
63 3,870,631
67 3,870,632
136 3,870,633
220 3,870,634
221 3,870,635
236 3,870,636
243 3,870,637
333 3,870,638
359 3,870,639
388 3,870,640
400 3,870,641

CLASS 211
37 3,870,153
74 3,870,154
3,870,155
3,870,156
90 3,870,157

CLASS 212
8R 3,870,158
13 3,870,159
39R 3,870,160
56 3,870,161
59R 3,870,162
73 3,870,163

CLASS 214
1BB 3,870,164
2.5 3,870,165
6BA 3,870,166
8.5SS 3,870,167
17 3,870,168
41 3,870,169
85 3,870,170
131R 3,870,171
140 3,870,172
152 3,870,173
303 3,870,174
304 3,870,175
308 3,870,176
372 3,870,177
450 3,870,178
454 3,870,179
621 3,870,180

CLASS 215
1C 3,870,181
220 3,870,182
247 3,870,183
255 3,870,184

CLASS 219
10.77 3,870,847
50 3,870,848
60A 3,870,849
85 3,870,850
97 3,870,851
121LM 3,870,852
125 3,870,853
145 3,870,854
202 3,870,855
216 3,870,856
267 3,870,857
328 3,870,858
370 3,870,860
437 3,870,859
459 3,870,861
464 3,870,862
532 3,870,863

CLASS 220
6 3,870,185
72 3,870,188
212 3,870,186
277 3,870,189
281 3,870,187
338 3,870,190
370 3,870,191

CLASS 221
86 3,870,192
150A 3,870,193
160 3,870,194
225 3,870,195

CLASS 222
1 3,870,196
52 3,870,197
105 3,870,198
189 3,870,199
206 3,870,200
207 3,870,201
226 3,870,202
262 3,870,204
397 3,870,203
402.17 3,870,205

CLASS 223
46 3,870,207
88 3,870,206

CLASS 224
2F 3,870,208
5V 3,870,209
42.45R 3,870,210

CLASS 225
34 3,870,211
42 3,870,212
100 3,870,213

CLASS 226
34 3,870,214
42 3,870,215
181 3,870,216
188 3,870,217

CLASS 228
4 3,870,218

CLASS 229
1.5C 3,870,220
4.5 3,870,219
16D 3,870,221
44R 3,870,222
72 3,870,223

CLASS 234
110 3,870,224

CLASS 235
1E 3,870,864
61.11E 3,870,865
61.12R 3,870,867
61.7R 3,870,866
89R 3,870,225
92FQ 3,870,869
92MB 3,870,870
92SB 3,870,868
151.3 3,870,226
197 3,870,871
3,870,872

CLASS 236
49 3,870,227

CLASS 237
59 3,870,228

CLASS 238
26 3,870,230
324 3,870,231

CLASS 239
15 3,870,232
3,870,233
132.3 3,870,234
177 3,870,235
542 3,870,236

CLASS 240
1.1 3,870,873
1.3 3,870,874
2R 3,870,875
41R 3,870,876

CLASS 241
1 3,870,237
27 3,870,238
186R 3,870,239

CLASS 242
18A 3,870,240
3,870,241
47.01 3,870,242
72.1 3,870,243
80 3,870,244
167 3,870,245
192 3,870,246
198 3,870,247
3,870,248
201 3,870,249

CLASS 243
6 3,870,250

CLASS 244
17.21 3,870,251
42CC 3,870,252
46 3,870,253
102SL 3,870,254
137 3,870,255

CLASS 245
8 3,870,256

CLASS 248
4 3,870,258
43 3,870,259
49 3,870,260
101 3,870,261
145 3,870,262
168 3,870,263
171 3,870,264
183 3,870,265
235 3,870,266
339 3,870,267
354P 3,870,268
394 3,870,269
406 3,870,270
3,870,271

CLASS 249
170 3,870,272
202 3,870,273

CLASS 250
209 3,870,877
239 3,870,878
269 3,870,879
273 3,870,880
283 3,870,881
305 3,870,882
324 3,870,883
339 3,870,884
360 3,870,885
367 3,870,886
370 3,870,887
384 3,870,888
398 3,870,891
480 3,870,889
483 3,870,892
560 3,870,890

CLASS 251
133 3,870,274
252 3,870,275

CLASS 252
51.5A 3,870,642
56R 3,870,643
62.1 3,870,644
62.56 3,870,645
107 3,870,646
118 3,870,647
135 3,870,648
301.3W 3,870,649
301.4R 3,870,650
364 3,870,651
421 3,870,652
429B 3,870,654
429R 3,870,653
435 3,870,655
451 3,870,656
464 3,870,657
465 3,870,658
522 3,870,659
545 3,870,660

CLASS 254
86R 3,870,276
88 3,870,277
98 3,870,278
105 3,870,279
134.3R 3,870,280

CLASS 259
1R 3,870,281
1 3,870,282
4 3,870,283
191 3,870,284
3,870,285

CLASS 260
2.5B 3,870,663
2.5F 3,870,661
2.5R 3,870,662
9 3,870,664
17.2 3,870,665
21 3,870,666
22CB 3,870,667
23.7R 3,870,841
28.5R 3,870,668
29.3 3,870,669
3,870,670
29.4R 3,870,671
29.6NR 3,870,672
29.6TA 3,870,673
30.2 3,870,674
32.8A 3,870,675
33.6AQ 3,870,676
37N 3,870,677
45.75N 3,870,679
45.85B 3,870,680
45.9R 3,870,678
49 3,870,681
3,870,682
75NH 3,870,684
75NT 3,870,683
75R 3,870,688
78R 3,870,685
79.1 3,870,686
3,870,687
87.5B 3,870,689
88.2R 3,870,690
92.1 3,870,691
93.7 3,870,692
94.9D 3,870,693
112.5 3,870,694
146R 3,870,695
158 3,870,696
173 3,870,697
210AB 3,870,698
210R 3,870,699
211.5R 3,870,700
226 3,870,701
3,870,702
229 3,870,703
233.3R 3,870,704
239E 3,870,707
239.1 3,870,705
3,870,708
3,870,709
239.3T 3,870,706
240A 3,870,712
240R 3,870,710
3,870,711
243C 3,870,713
247.2B 3,870,715
247.5EP 3,870,714
248NS 3,870,716
249 3,870,717
250Q 3,870,718
251.5 3,870,719
256.5R 3,870,720
281 3,870,721
283R 3,870,722
293.8 3,870,723
297V 3,870,724
302H 3,870,725
309 3,870,726
326.5 3,870,727
340.9 3,870,728
348.5L 3,870,729
369 3,870,730
396R 3,870,731
408 3,870,732
410.8 3,870,733
413 3,870,734
419 3,870,735
429.7 3,870,736
448R 3,870,737
449S 3,870,738
453P 3,870,739
456A 3,870,740
464 3,870,742
465C 3,870,743
465F 3,870,744
465R 3,870,745
465.3 3,870,746
468G 3,870,747
475F 3,870,748
484P 3,870,749
502.5 3,870,750
515A 3,870,753
515R 3,870,751
3,870,752
524R 3,870,754
553R 3,870,755
558A 3,870,756
559R 3,870,757
562R 3,870,758
586C 3,870,761
586G 3,870,759
586P 3,870,760
654D 3,870,762
666A 3,870,763
680E 3,870,764
683.51 3,870,765
825 3,870,766
836 3,870,767
857G 3,870,768
876R 3,870,769
879 3,870,770
944 3,870,771
961 3,870,772

CLASS 261
111 3,870,773
CLASS 264
40 3,870,774
42 3,870,588
46.4 3,870,741
53 3,870,775
61 3,870,776
71 3,870,777
164 3,870,778
CLASS 267
64R 3,870,286
113 3,870,287
CLASS 269
45 3,870,288
324 3,870,289
CLASS 270
30 3,870,290
31 3,870,291
68R 3,870,292
CLASS 271
3.1 3,870,294
173 3,870,295
231 3,870,293
CLASS 272
8N 3,870,296
58 3,870,297
CLASS 273
1R 3,870,298
32B 3,870,299
3,870,300
34B 3,870,301
44 3,870,302
85D 3,870,303
95R 3,870,304
101.1 3,870,305
105.6 3,870,306
121A 3,870,307
126A 3,870,308
128CS 3,870,309
131AB 3,870,311
131BA 3,870,310
135F 3,870,312
143C 3,870,313
185D 3,870,314
186E 3,870,316
186R 3,870,315
188R 3,870,317
CLASS 274
9R 3,870,318
13R 3,870,319
23A 3,870,320
39A 3,870,321
CLASS 277
167.5 3,870,322
CLASS 279
112 3,870,323
CLASS 280
11.28 3,870,324
11.35K 3,870,327
11.35N 3,870,325
11.35T 3,870,326
11.37E 3,870,328
16 3,870,329
3,870,330
28 3,870,331
47.35 3,870,333
87.01 3,870,334
90 3,870,335
124F 3,870,336
154.5R 3,870,337
209 3,870,338
414R 3,870,339
415B 3,870,340
423R 3,870,341
433 3,870,342
457 3,870,343
CLASS 281
21 3,870,344
CLASS 285
24 3,870,345
35 3,870,332
47 3,870,346
156 3,870,347
197 3,870,348
249 3,870,349
286 3,870,350
334 3,870,351
CLASS 290
53 3,870,893
CLASS 291
15 3,870,352
CLASS 292
37 3,870,353
116 3,870,354
307R 3,870,355
CLASS 294
67A 3,870,356
74 3,870,357
77 3,870,358
118 3,870,359
CLASS 296
37A 3,870,360
146 3,870,361
CLASS 297
155 3,870,362
232 3,870,363
294 3,870,364
320 3,870,365
440 3,870,366
CLASS 298
1B 3,870,367
CLASS 299
31 3,870,368
71 3,870,369
91 3,870,370
CLASS 301
1 3,870,371
63PW 3,870,372
CLASS 302
14 3,870,373
28 3,870,374
42 3,870,375
CLASS 303
21EB 3,870,378
21F 3,870,377
21P 3,870,376
CLASS 305
35EB 3,870,379
36 3,870,380
CLASS 307
9 3,870,894
10AT 3,870,895
34 3,870,896
208 3,870,897
232 3,870,900
233 3,870,898
235 3,870,899
238 3,870,901
247 3,870,902
252B 3,870,904
252N 3,870,903
254 3,870,905
261 3,870,906
CLASS 308
3.5 3,870,381
9 3,870,382
82 3,870,383
187.2 3,870,384
CLASS 310
64 3,870,907
66 3,870,910
91 3,870,908
3,870,909
155 3,870,911
183 3,870,912
208 3,870,913
219 3,870,914
CLASS 312
30 3,870,386
218 3,870,387
257A 3,870,388
257R 3,870,389
263 3,870,390
297 3,870,391
CLASS 313
32 3,870,915
3,870,916
105 3,870,917
131R 3,870,918
220 3,870,919
278 3,870,920
346R 3,870,921
389 3,870,002
CLASS 315
39.55 3,870,923
200A 3,870,924
383 3,870,922
CLASS 317
9R 3,870,925
12B 3,870,926
3,870,927
13R 3,870,928
96 3,870,929
100 3,870,930
146 3,870,931
157.6 3,870,932
262AE 3,870,933
CLASS 318
7 3,870,934
52 3,870,935
85 3,870,936
314 3,870,937
605 3,870,938
611 3,870,939
633 3,870,940
636 3,870,941
CLASS 320
2 3,870,942
CLASS 321
3,870,943
8R 3,870,944
9A 3,870,945
15 3,870,946
CLASS 324
16R 3,870,947
34PE 3,870,949
34PS 3,870,948
51 3,870,950
61P 3,870,951
65R 3,870,952
73R 3,870,953
158MG 3,870,954
CLASS 325
2 3,870,955
150 3,870,957
155 3,870,958
156 3,870,959
446 3,870,960
457 3,870,961
478 3,870,956
CLASS 328
58 3,870,962
59 3,870,963
CLASS 330
29 3,870,964
30D 3,870,966
3,870,967
30R 3,870,965
207P 3,870,968
CLASS 331
1A 3,870,969
25 3,870,970
108D 3,870,971
140 3,870,972
CLASS 332
12 3,870,973
CLASS 333
3,870,974
30R 3,870,975
81R 3,870,976
84R 3,870,977
97R 3,870,978
CLASS 334
14 3,870,979
CLASS 335
202 3,870,980
296 3,870,981
297 3,870,982
CLASS 337
57 3,870,229
107 3,870,983
161 3,870,984
381 3,870,985
CLASS 338
128 3,870,986
214 3,870,987
CLASS 339
14R 3,870,392
48 3,870,385
144T 3,870,393
CLASS 340
3R 3,870,988
6R 3,870,989
38L 3,870,990
41R 3,870,991
CLASS 343
5DP 3,870,992
6.5R 3,870,993
3,870,994
18E 3,870,995
3,870,996
3,870,997
100CL 3,870,998
103 3,870,999
771 3,871,000
872 3,871,001
CLASS 346
74ES 3,870,257
3,871,003
74TP 3,871,002
75 3,871,004
CLASS 350
7 3,870,394
96WG 3,870,396
3,870,397
96B 3,870,399
96C 3,870,395
3,870,398
214 3,870,400
3,870,401
3,870,402
276 3,870,403
281 3,870,404
294 3,870,405
CLASS 352
159 3,870,406
194 3,870,407
CLASS 353
26 3,870,410
27 3,870,409
73 3,870,411
109 3,870,412
120 3,870,408
CLASS 354
38 3,871,005
40 3,871,006
79 3,871,009
86 3,871,010
152 3,871,011
246 3,871,012
317 3,871,013
CLASS 355
53 3,870,413
CLASS 356
109 3,870,414
124 3,870,415
138 3,870,416
208 3,870,417
226 3,870,418
CLASS 357
26 3,871,017
49 3,871,007
65 3,871,008
67 3,871,014
3,871,015
68 3,871,016
74 3,871,018
CLASS 358
4 3,871,019
8 3,871,020
10 3,871,021
23 3,871,022
28 3,871,023
CLASS 360
33 3,871,024
85 3,871,025
CLASS 401
8 3,870,419
121 3,870,420
259 3,870,421
CLASS 404
31 3,870,422
41 3,870,423
67 3,870,424
76 3,870,425
82 3,870,426
103 3,870,427
134 3,870,428
CLASS 408
1 3,870,429
6 3,870,430
111 3,870,431
191 3,870,432
CLASS 415
72 3,870,433
CLASS 416
160 3,870,434
CLASS 417
299 3,870,436
310 3,870,437
356 3,870,438
454 3,870,439
CLASS 418
248 3,870,440
CLASS 423
50 3,870,779
206 3,870,780
242 3,870,781
396 3,870,782
415 3,870,783
422 3,870,784
460 3,870,785
484 3,870,786
598 3,870,787
3,870,788
CLASS 424
3 3,870,789
19 3,870,790
22 3,870,791
57 Re.28,363
250 3,870,792
264 3,870,794
269 3,870,793
270 3,870,795
330 3,870,796
352 3,870,797
CLASS 425
4C 3,870,441
28R 3,870,443
117 3,870,442
143 3,870,444
144 3,870,445
174.4 3,870,446
225 3,870,447
242B 3,870,448
251 3,870,449
269 3,870,450
378R 3,870,451
387B 3,870,452
465 3,870,453
466 3,870,454
CLASS 426
53 3,870,798
62 3,870,799
65 3,870,800
92 3,870,801
106 3,870,802
128 3,870,803
141 3,870,804
148 3,870,805
152 3,870,806
194 3,870,807
250 3,870,808
287 3,870,809
329 3,870,810
348 3,870,811
350 3,870,812
509 3,870,813
CLASS 431
7 3,870,455
8 3,870,456
66 3,870,457
80 3,870,458
328 3,870,459
CLASS 432
11 3,870,460
3,870,461
72 3,870,462
247 3,870,463

CLASSIFICATION OF DESIGNS

D2— 24 234,444
234,445
D6— 112 234,446
113 234,447
D7— 13 234,448
62 234,449
128 234,450
D8— 17 234,451
114 234,452
220 234,453
224 234,454
D9— 233 234,455
182 234,456
D10— 62 234,469
234,469
D19— 18 234,473
51 234,471
59 234,457
D22— 1 234,458
234,459
27 234,460
D23— 2 234,461
43 234,462
234,463
62 234,464
78 234,465
D26— 5C 234,466
D29— 1R 234,467
D52— 3 234,468
D55— 1F 234,470
D96— 3 234,472

CLASSIFICATION OF PLANTS

P. — 88 3,688
P. — 3,689
P. — 3,690

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,870,191
3,870,403
2 : 3,869,959
3,870,156
3 : 3,870,993
4 : 3,869,787
3,869,905
3,870,062
3,870,178
3,870,301
3,870,333
3,870,940
3,870,965
3,870,967
3,871,022
5 : 3,870,261
3,870,449
3,870,629
3,870,959
6 : 3,869,731
3,869,732
3,869,739
3,869,749
3,869,752
3,869,753
3,869,775
3,869,781
3,869,789
3,869,804
3,869,816
3,869,829
3,869,835
3,869,837
3,869,841
3,869,863
3,869,890
3,869,891
3,869,892
3,869,900
3,869,901
3,869,971
3,869,974
3,869,977
3,869,980
3,870,009
3,870,021
3,870,022
3,870,025
3,870,026
3,870,027
3,870,033
3,870,038
3,870,066
3,870,071
3,870,089
3,870,096
3,870,098
3,870,129
3,870,176
3,870,200
3,870,209
3,870,212
3,870,249
3,870,251
3,870,255
3,870,275
3,870,280
3,870,297
3,870,315
3,870,317
3,870,332
3,870,338
3,870,341
3,870,353
3,870,359
3,870,387
3,870,408
3,870,458
3,870,460
3,870,468
3,870,473
3,870,534
3,870,555
3,870,577
3,870,578
3,870,579
3,870,587
3,870,602
3,870,631
3,870,668
3,870,672
3,870,676
3,870,715
3,870,764
3,870,773
3,870,777
3,870,786
3,870,804
3,870,817
3,870,818
3,870,821
3,870,823
3,870,824
3,870,839
3,870,849
3,870,866
3,870,872
3,870,874
3,870,889
3,870,903
3,870,906
3,870,907
3,870,917
3,870,921
3,870,924
3,870,929
3,870,949
3,870,957
3,870,958
3,870,962
3,870,964
3,870,995
3,870,997
3,871,001
3,871,015
8 : 3,869,831
3,869,875
3,870,076
3,870,190
3,870,278
3,870,426
3,870,478
3,870,495
3,870,819
3,870,826
3,870,926
9 : Re.28,362
3,869,780
3,869,790
3,869,811
3,869,820
3,869,843
3,869,862
3,869,885
3,869,899
3,869,951
3,869,986
3,870,084
3,870,091
3,870,164
3,870,181
3,870,204
3,870,445
3,870,467
3,870,471
3,870,487
3,870,607
3,870,674
3,870,677
3,870,713
3,870,718
3,870,758
3,870,781
3,870,784
3,870,857
3,870,977
10 : 3,870,037
3,870,624
3,870,709
11 : 3,870,415
12 : 3,869,727
3,869,747
3,869,819
3,869,821
3,869,887
3,869,911
3,869,913
3,869,972
3,870,043
3,870,059
3,870,063
3,870,069
3,870,105
3,870,136
3,870,185
3,870,203
3,870,343
3,870,391
3,870,422
3,870,425
3,870,484
3,870,490
3,870,562
3,870,586
3,870,600
3,870,828
3,870,953
13 : 3,870,223
3,870,991
3,871,021
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DESIGN PATENTS

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PLANT PATENTS

12 : 3,688

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